THE IRON AGE

New York, May 18, 1916

ESTABLISHED 1855 VOL. 97 : No. 20

New Housing Development at Worcester

Norton Company's Plan Under Which Its Employees May Own Homes in an Unusual Environment—Groups of 30 to Be Built Annually

BY W. E. FREELAND

"AT one time or another in his life every man, even to the grouchy old bachelor, has dreamed of having a little home of his own that nestles somewhere on a hillside, sheltered from the harsh winds of winter and blessed by perpetual sunshine all the year around. He wants it cozy, attractive, a credit to himself and his neighbors, and usually his imagination pictures it as being backed by tall trees, surrounded by a green and well-kept lawn, and o'er-twined by clinging vines which give it the quaint air that lends distinction to what would otherwise be commonplace."

This is the opening paragraph in one of the first announcements of the proposed development of the Indian Hill community in the monthly shop paper of the Norton Company and Norton Grinding Company, Worcester, Mass. It needs but a glance at the illustrations which accompany this article to see the progress made last year toward the ideal thus set forth.

The wish to see his workmen properly housed is to-day in the mind of many a manager of a large industry, but the actual initiation and execution of a comprehensive plan for adequate housing has taken form in but comparatively few instances. Rare, indeed, is it to find such a community founded solely on the idea of ownership by the occupant with all thought of renting eliminated. The houses, the environment, the plan of purchase and the lack of paternalism in the development here described help to make this one of the noteworthy industrial communities of the country.

For the purpose of carrying out its plans, the Norton Company formed a subsidiary company, the Indian Hill Company, with the same ownership and officers. This was done largely to comply with the State corporation laws. One of the first steps was the selection of Grosvenor Atterbury of New York as the planner and consulting architect. Mr. Atterbury, among his other activities, is the consulting architect of Johns Hopkins University, a director of the National Housing Association, and the architect and designer of the famous community development of the Russell Sage Foundation at Forest Hills, Long Island, N. Y.

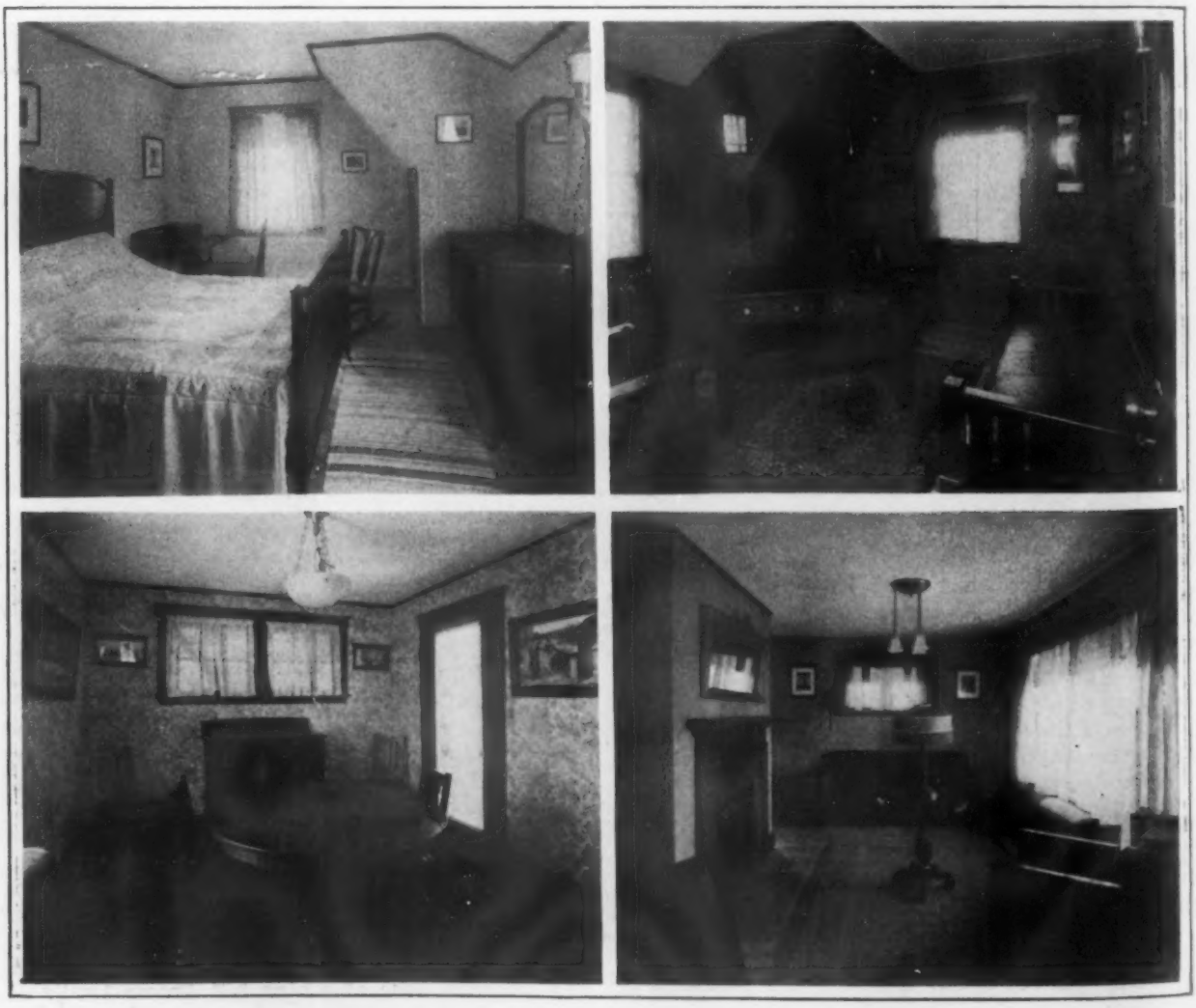
The location selected for the community was on the southern slope of a high hill, known locally as Mount Ararat, which lies just beyond the plant of

The Indian Hill Development of the Norton Companies in December, 1915. In the Thirty Houses Erected in 1915, Diversity of Appearance Was Secured Not Only by Differences in Exterior Plans But Also by Varying Combinations of Stucco, Shingle and Clapboard Finish

First and Second Floor Plans of a $3,800 House

the Norton Company. From this slope one gets a view over beautiful Indian Lake, a wide expanse of low rolling hills dotted with fine homes, and, in the distance, the city of Worcester. In the laying out of the streets, with their sweeping curves, the finest arts of the town planner were called into play. Low grades were thus secured and the constant shifting of view as one walks along the streets is distinctly an asset. Every opportunity was taken to preserve or enhance the natural beauty of the site. By setting back the houses a good distance from the street line, the effect of wide avenues was obtained on the main thoroughfares.

Every modern improvement was to be included in this development, so the first step was the construction of streets with good gutters and granolithic sidewalks, the laying of water mains and sewers and the building of an electric lighting line from the city circuits. One feature of the plans which is especially noteworthy is the community center, where eventually such stores as may be necessary to the community will be found and possibly a building for community gatherings. Reservations have been made for the erection of schools and churches and for public parks. These are fundamental features of community building of the high-



Group of Interior Views in One of the Larger Houses Selling for $3,800

est type. While Indian Hill will have all the advantages that mark city life, it will retain much of the character of a suburban village. No point that will serve to add to its attractiveness has been overlooked. Trees, shrubs and grass plots will abound when the contracts already signed for this summer's work have been executed. There will

Thirty more houses are to be erected this year. There is none of the similarity of outline and general appearance which characterizes the usual construction of moderate cost homes. There is much individuality to each house without sacrificing utility or durability. It is needless to state that much care has been given to sanitation and domestic convenience.

Interior Views in a House Selling for $2,800

be no objectionable fences, low hedges taking their place and adding in themselves a touch of beauty. Many of the lots are shaded by well-grown trees and others will be planted on lots less favored. The streets will be lined with trees carefully selected for the climate and location. Groups and clusters of flowering shrubs will be found, not only on individual lots, but also about the community center and the park spaces.

There are no narrow lots and the houses are located to the best possible advantage, particular attention having been given to two things: first, that as far as possible there be an unrestricted view about the home, and, second, that the view of the lake and the city from these homes should be unobstructed.

By building in a wholesale way a group of 30 houses last year, the cost was kept to a minimum.

One of the things which interest every home owner is to know in what manner the activities of his neighbors will influence the future value of his own property. Such restrictions as are imposed upon purchasers of Indian Hill homes have this in view. It is essential in a community of this type that there be the utmost spirit of co-operation, and the company is making every effort to admit to the community only families of the type that will be unobjectionable to the other purchasers. The property is to be used for residence purposes only, and no building, fence, wall or other structure can be erected without the written consent of the company.

The cost of the land unimproved averaged 4c. a foot. The expense of improvement brings the cost of the land up to 10c., at which price it is sold to the employees. The houses and land are sold at

First and Second Floor Plans of a $2,800 House

prices ranging from $2,800 to $3,800. Ten per cent, in a few cases 5 per cent, of the purchase price is paid to the company one week before the employee enters the new house. At the same time he is examined by the company's physician, due to the insurance feature noted later. The purchaser gives a 12-year note to the company for $1,000 and a demand note for the balance of the purchase price. Both notes are secured by a mortgage on the property. To secure further the payment of the first note, there is a special agreement in which the purchaser covenants that he will purchase five shares in a co-operative bank approved by the company and assign his bank holdings to the company. In the banks approved by the company, five shares will mature at 5 per cent in the sum of $1,000 in 12 years and 2 months. These banks, however, have always paid over 5 per cent and maturities have always been well within 12 years. The company agrees that at any time during the twelve years, upon the death of the purchaser, it will accept the surrender value of his bank holdings at the time of his death in full satisfaction of the time note of $1,000, and that the company will not make demand upon the demand note so long as the purchaser is not in default under the terms of his mortgage or under the terms of this agreement relative to co-operative bank investment.

The Norton Company does not take from the wages of the purchasers of houses any payments due, either by way of interest or for purposes of bank deposit, but insists that the respective purchasers shall make their own payments direct to the cashier of the company. The co-operative bank feature was introduced to encourage saving on the part of the purchasers, to introduce to them the advantages of this method of investment and to avoid any suspicion on the part of the purchaser that the company was making any profit on the transaction. Accordingly, interest payments alone are made to the company until the entire amount of the time note is paid over at maturity.

The company desires every man to do his own business and will not exercise paternalism toward the purchaser. He must take care of taxes, water rates, insurance, etc. If circumstances should compel a man to move away and relinquish his ownership of the property and he is able and willing to satisfy the company that the initial purchase was not made as a speculative venture, it will assume a first option on the property and refund a portion of the sum paid in, reserving sufficient of it to pay a reasonable rent and the wear and tear during the period of occupancy.

The company now holds 175 acres of land which it hopes ultimately to develop in the same manner as the section now developed or under way. The first 30 houses were sold promptly and there are now many prospective purchasers for the 30 houses to be built this year.

View from Indian Hill Looking across Indian Lake toward the City of Worcester

Preventing Boiler Corrosion by the Cumberland Process

The Cumberland process for preventing the corrosion of boilers, condensers and other metallic vessels and structures in contact with water or other corrosive liquids was discussed at a recent meeting of the Institute of Marine Engineers (British). The process has been extensively adopted in England. It depends for its action on the application of an electromotive force to overcome those produced by two dissimilar metals, or the same metal in different conditions, in contact with an electrolyte. This is accomplished by fitting one or more iron electrodes into the vessel to be protected and connecting them to the positive pole of a small dynamo, generating a continuous current at a pressure of about 8 volts.

The iron electrodes are insulated from the vessel, to which the negative pole of the dynamo is electrically connected, so that a current flows from the iron electrode to the walls of the vessel while the apparatus is in use. This has the effect of confining the corrosion entirely to the iron electrodes, which are gradually eaten away, but which can be replaced at a trifling cost. The current is regulated by resistances and measured by an ammeter. In the case of boilers it has been found that the system not only prevents corrosion, but also prevents the formulation of scale and removes any old-standing scale which may have been deposited before the apparatus was installed.

The current necessary to afford complete protection in the case of a condenser is about 1 ampere for each 500 sq. ft. of cooling surface, so that a condenser with 6000 sq. ft. of surface would require a current of 12 amperes. The energy required at 8 volts would therefore be 96 watts, and the cost at ½d. per kilowatt-hour would be 35s. per annum, running continuously. Six cast-iron electrodes, each weighing 20 lb., would be used in such a condenser and these would have to be renewed once a year, at a cost of about 15s.

In boilers where the question of scale formation has to be considered a rather heavier current is necessary, and for ordinary marine boilers about 1 ampere is usually allowed to each 300 sq. ft. of heating surface. If corrosion only has to be guarded against, a smaller current density can be used. A case is mentioned of a vessel having twelve Yarrow boilers, each with 4125 sq. ft. of heating surface, which it was found in practice could be completely protected from corrosion, and kept quite free from scale, with a current of 5 amperes per boiler, though when installing the system it had been decided to supply 14 amperes per boiler. The electrodes in each of these boilers consisted of two 7-ft. lengths of ¾-in. by 3-in. bar iron fitted in the steam drum joint below the water level. Their life will be considerably longer than two years.

The Aeroplane Industry's Great Growth

The remarkable growth of the aeroplane industry of the United States is indicated by the exports of 398 aeroplanes for 1915 against 40 in 1914 and 19 in 1913. The value of the 1915 exports was $2,960,814 or an average of $7,439 per machine, against $6,337 in 1914 and $3,227 in 1913. The exports of aeroplane parts were also very large, amounting to $2,457,782 as compared with only $145,997 in 1914 and $25,606 in 1913. Imports of aeroplanes into the United States decreased from 16 and 13 in the fiscal years of 1912 and 1913, respectively to only 1 each in the fiscal years of 1914 and 1915.

An Improvement in Open-Hearth Practice

A Movable Port of German Design, Built as a Cage, and Applicable to Furnaces So As to Increase the Number of Heats

An article in a recent issue of *Stahl und Eisen*, by K. Kniepert, describes an improvement in open-hearth practice introduced at the Resicza plant in Austria-Hungary, by Adolf Zdanowicz, and now in use in several plants in that country. It is intended to be applied when the ports are burned back so

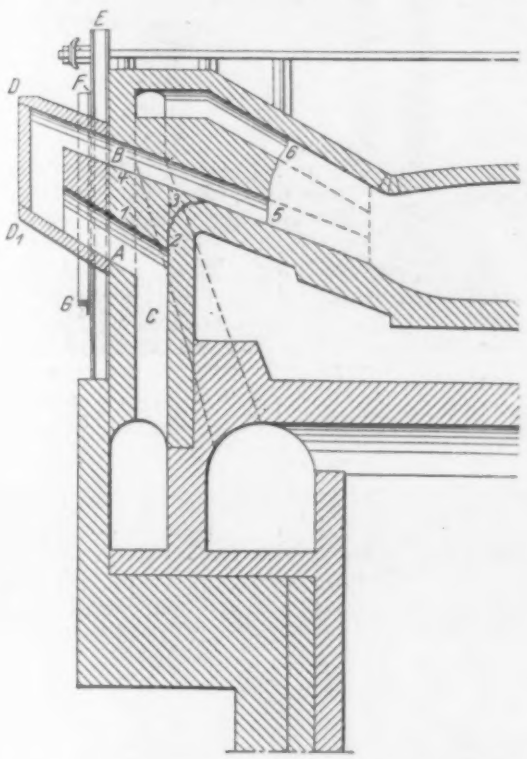


Fig. 1—An Open-Hearth Furnace Port with the Cage in Place

that there is danger to the roof, and the furnace is not working well. When this time comes, the open-hearth superintendent must choose between shutting down and rebuilding the ports, or adopting some method that will help the gas to enter the furnace properly. Among these methods may be mentioned the narrowing of the enlarged gas ports, and raising the level of the back part of the gas ports, but none of them gives very great satisfaction. The best practice is to shut down, and properly repair the ports, which entails a delay of more than a week, as well as the cost of fuel for heating up again.

The patented Zdanowicz port construction can be applied during the week-end shut-down, which is customary in European plants, and allows the usual resumption of operation Monday morning with proper introduction of gas to the furnace due to the improved port. Fig. 1 is a sketch of the end construction with the device or cage in position. Fig. 2 shows the ironwork of the cage, and Fig. 3 shows a cage ready to be applied. The irregular line 5-6, in Fig. 1, shows the outline of the burned-back port, and 3 shows how the original sharp corner has been burned away.

The port is prepared to receive the cage as follows: The end wall of the vertical gas flue is cut away from the outside from *A* to *B*, and the flue is covered with an arch 1, 2, 3, 4. The part above *B* was always so covered. Openings are made in the end wall at *A* and *B* to correspond with the ports in the cage, which is complete except for its end wall *D*-D_1. By means of the overhead crane, which is available in all modern open-hearth plants, the cage is placed in position. For a 35-ton furnace each cage weighs nearly three tons. In order to get tight joints it is well bedded in mortar. It is best fastened by hanging from the upper end of the upright end girder *E*, and bolting the angles *F*-*G* to this girder, Fig. 2. Further support has been found to be unnecessary. All joints and roughness are smoothed over through the open end wall *D*-D_1, which is afterward bricked up, and the gas can be again admitted to the furnace. All four cages can be installed in 12 hr., if work is carried on at both ends of the furnace at the same time, and at the most the furnace can be started again at the end of 24 hr.

The length of the gas port before the repair may be about 40 in.; and after the repair this is increased by the width of the uptake, the thickness of the end wall, and the length in the cage, giving a total of about 100 in. This is a good length and exceeds that found in many new furnaces. The conditions in the furnace are improved because the end of the port no longer projects into the extremely heated portion of the furnace, and is, therefore, protected against further burning back. Also, if proper attention has been given to the fire bridge, the gas enters the furnace as it should and gives a

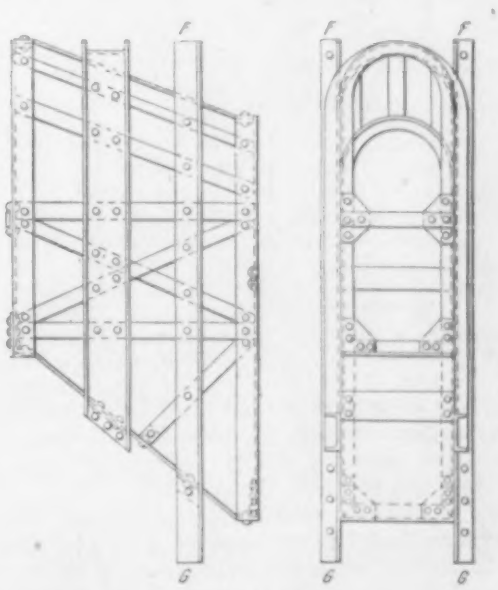


Fig. 2—Iron Work Used in the Cage

normal flame. There is no longer danger to the furnace as the gas flows along the bath, far removed from the roof.

The writer then goes into details of the cost of these cages and the results obtained. At Resicza a 34-ton furnace had made 371 heats; the cages were applied and 275 more were obtained. Another time after 344 heats the cages were used and 202 heats

obtained, the stoppage then being due to the checkers. On another occasion after 378 heats the cages were used and 328 heats more taken off, this time also the checkers causing the shut down. On a 10-ton furnace at the same plant the heats obtained on different runs with the cages in position were 348, 385, 471, 517 and 434.

In considering the cost it must be remembered that the ironwork of the cages will certainly last ten times. The total weight of a full set for a 34-ton furnace, with all bolts, etc., is 3.4 tons. This means 102 marks per furnace for each application. The total weight of the silica brick work for a full set is about 8 tons, costing, under Austrian conditions, 320 marks. Not all of this brickwork will have to be replaced before the cages can be used again. Labor is taken at 210 marks and royalty for one campaign 250 marks. Assuming an extra 250 heats for a 34-ton furnace the cost is 10.6 pf. per ton (about 2.5c.). Counting the other necessary repairs, and subtracting the total from what would otherwise be necessary, a saving is found of 79 pf. (19c.) per ton.

The total for the year on this size furnace is, therefore, 13,430 marks, and when the saving in fuel is added, due to the furnace not becoming cold, it gives 14,500 to 15,000 marks ($3,480 to $3,600). This estimate is undoubtedly low, for certainly one set of cages can be used for more than one furnace. A further great advantage is the

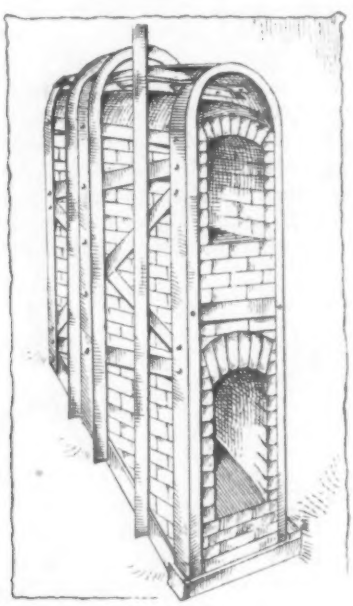


Fig. 3—The Iron Cage with the Brick Put in to Form the Port Extension Ready to Be Applied to the Furnace

greater yearly output per furnace, for under European conditions at least 14 more working days per year can be obtained, which means an increased yearly tonnage of about 5 per cent.

The invention is particularly valuable in the case of furnaces that have been altered to give larger heats than they were designed for. In such cases the hearth is usually lengthened at the expense of the ports. The application of the cages to such furnaces gives at once a good working length for the ports. The results given above on the 10-ton furnace were obtained with a furnace so equipped, and making nothing but special steels. G. B. W.

Through a typographical error the elevating truck of the Lewis-Shepard Company, Boston, Mass., which was illustrated in THE IRON AGE, May 4, on page 1079, was stated as being capable of lifting a load 2½ to 3 ft. This should have been 2½ to 3 in.

REJUVENATED TURRET LATHE

Details of Remodeling an Old Machine Under the Spur of Necessity

BY W. A. HYDE

The steel weight described below could not be obtained satisfactorily on the outside either as regards price, finish or time of delivery, and the following solution shows what may be done under

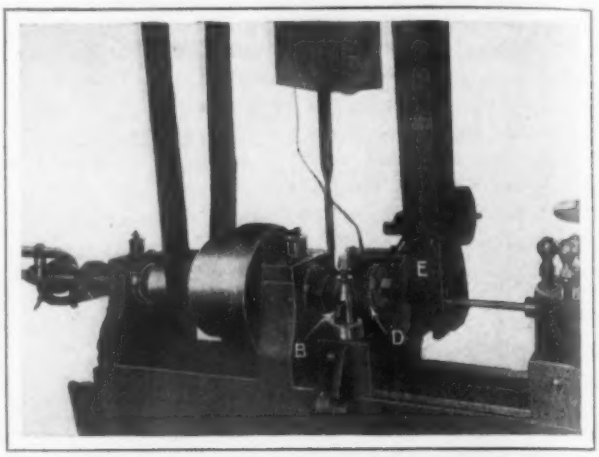


Fig. 1—A Turret Lathe Changed to Produce a Slotted Weight ¾ In. in Diameter and Approximately Half as Long. The Hand Levers for Closing the Clutch Are Shown at the Left and the Saw for Slotting the Work at the Right at *D*

pressure of circumstances. The piece was to be 0.750 in. in diameter, 0.382 in. long, chamfered on both edges, and must have a slot in the side 0.030 in. wide and 0.250 in. deep. A turret machine would do it, but none was available, and those accessible had no transverse milling attachment. After a search, however, an old machine was found for $40, so old that the manufacturer had gone out of business, but in splendid condition as regards bearings and steadiness. There was no automatic rod feed, and although there was a hole through the spindle it was too small.

The first step was to bore out the spindle. A Rivett ¾-in. split chuck was obtained and the subsequent work built around this. A piece of 1-in. No. 13 seamless steel tubing was procured and the end swaged out large enough to enable a thread to be cut to fit the chuck as is shown in Fig. 2. The swaging was done by heating the tube red hot and driving in a tapered plug of the proper size. A thread was then cut in the enlarged end in the lathe so that the chuck fitted in nicely. A slot was cut, as shown at *a*, to engage the driving pin from the spindle. Lock nuts having 32 threads per inch were fitted to the opposite end.

The reamer was made by using ¾-in. stock

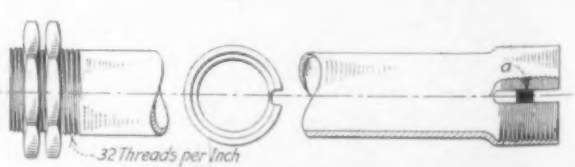


Fig. 2—The Spindle Made from a Piece of No. 13 Gage Seamless Steel Tubing Swaged to Fit the Chuck and Slotted to Engage the Driving Pin

and driving tool steel pins in four spiral rows, as illustrated in Fig. 2. The rod was centered and the pins turned to a maximum diameter of 1 1/16 in. and a minimum diameter of 11/16 in., this being just a little smaller than the hole through the spindle. These pins extended a distance of 2 in.

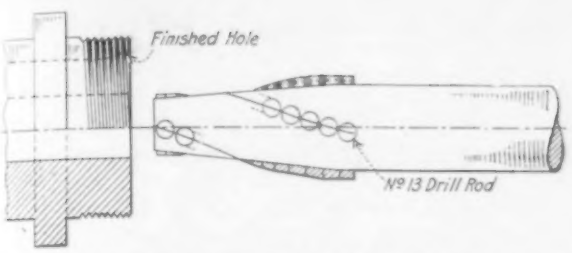


Fig. 3—A Home-Made Reamer Consisting of a Piece of ¾-In. Drill Stock and a Series of Tool Steel Pins

along the axis, giving an easy taper, were backed off to give clearance and ground off in front to give a cutting edge, and then hardened. The spiral twist to the cutting edges not only enabled the pins to be staggered and provide a continuous cutting edge, but gave the reamer some of the characteristics of a drill, and it was found that it cut very freely. If too great a spiral was made there was a tendency to "hog," and if there was no twist it cut very slowly. The pins were not annealed, and while a few broke we succeeded in getting a smooth, true hole. The other end of the reamer was fastened in the turret and thus the lathe was made to bore itself out.

Automatic rod feed was essential and the next thing was a study of the succession of motions required. It was decided to release the chuck by a motion away from the operator and close by drawing toward him. This combined well with the motions of the turret and the tool carriage levers. Accordingly the chuck closing device was made as in Fig. 4. Here *a* is the projecting end of the lathe spindle, *b* the collar that carries the two fingers *c*, *d* is a sleeve, one end of which transmits the pressure exerted by the fingers to the adjusting nuts *e*, and *f* is the cone, which, when sliding to the right, raises the fingers and closes the chuck and to the left releases them.

The next step was to make the feed automatic. A 20-lb. weight, two pulleys and some wire rope sufficed for this when arranged as in Fig. 5.

The front end of the spindle had to be bored to a diameter of 1 7/16 in. to take the chuck, which was accomplished by the same reamer with longer

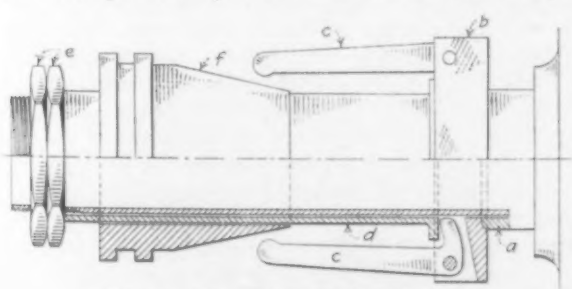


Fig. 4—The Chuck Closing Device

pins. When the front end of the spindle was chamfered to the requisite 15-deg. angle and the chuck attached, all parts were found to fit nicely.

The weight required a slot in the side 0.03 in. wide and 0.25 in. deep. A thin saw, 3 in. in diameter and 1/32 in. thick, fastened to the tool carriage and moved transversely would do this, and it was only a step to the idea of cutting off the previous weight with a saw of larger diameter on the same shaft. Hence the layout as shown in Fig. 1. Here *B* is the chamfering tool moving away from the operator and *D* is the cut-off saw, which is 4 in. in diameter and 3/64 in. thick. These diameters were such that when one saw had just cut off a weight the other had cut the required slot, ¼ in. deep, the lathe, of course, being stopped during this operation. A positive jaw clutch came with the lathe, so that there was no tendency to turn by friction when not in engagement and the friction of the spindle in its bearings held the stock sufficiently tight. The shaft carrying the saws is driven through the 2-in. belt *E* from the countershaft above. An idler pulley serves to take up the stretch in the belt and the variations due to the different positions. The spring on the idler pulley shaft is about 2 in. long, 1¼ in. in diameter and is made of 3/16-in. wire . A longer one was used at first, but the period was so slow that annoying vibrations were set up in the belt. About 25 lb. is used against the idler shaft and the belt is run quite tight.

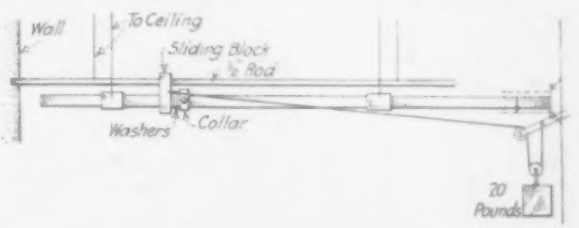


Fig. 5—The Arrangement Employed to Secure Automatic Feed

At first the large saw was of carbon steel, 1/32 in. thick, but it cut too slowly at 165 r.p.m. The speed was later increased to 240 r.p.m., but the saw dulled quickly and it was replaced by a high-speed saw 3/64 in. thick. At the prevailing prices this was $2.15 less than one 1/32 in. thick; besides, it was thought that such a thin saw might bend and produce variations in the thickness of the weight, and flanges 3⅛ in. in diameter were provided to stiffen the blade as much as possible. Then, too, it was highly desirable that the faces of the weights be as smooth as possible and a thicker saw would help this. Also, as a last resort, it was contemplated to taper the cutting edges of the teeth, if necessary, which should produce a smooth surface. At all events, the 3/64-in. saw is perfectly satisfactory without alteration, giving a smooth cut at 240 r.p.m. This might be improved somewhat at a higher speed.

It is thought that the performance of this machine is superior to the usual cut-off tool method in speed, small waste stock and uniformity. A tool has one cutting edge; the saw has 36. A 3/64-in. tool will break if forced too hard and the finished surface is full of ridges, requiring a subsequent hand operation if a good finish is desired. With the above method a small lip is left on one side only to be smoothed off. The most interesting part, however, is the time—10 sec. for cutting off and slotting—a performance which a cut-off tool can hardly meet. On test two weights were made per minute, which was entirely satisfactory.

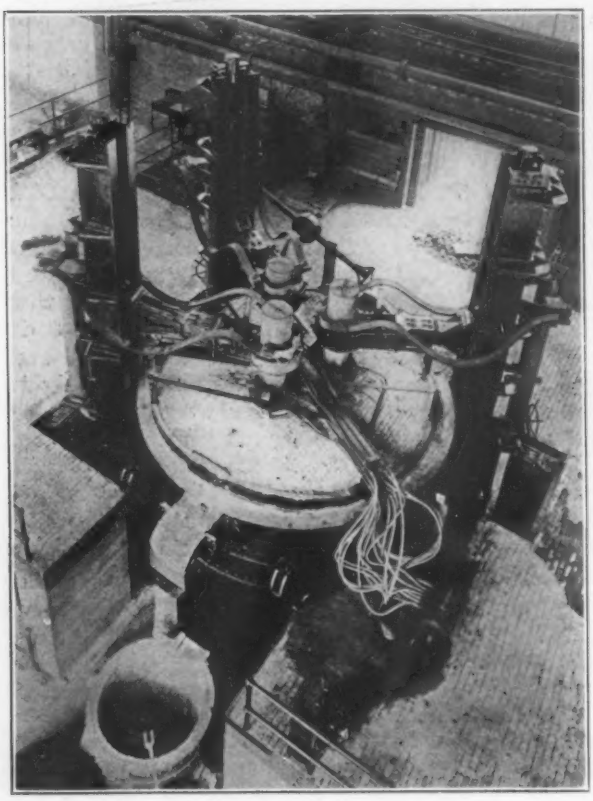
A Recent Type of Slip Ring Induction Motor

The Westinghouse Electric & Mfg. Company's slip ring induction motors for intermittent service are supplied in units ranging from 1½ to 200 hp. for operation on two or three phase, 25 and 60 cycle circuits, delivering either 220 or 440 volts. These motors are designed for use on cranes, hoists, draw and roller lift bridges, railroad turntables and transfer tables. Steel laminations riveted between forged steel end shields are employed for the frames of the smaller sizes, while those of the larger units are made of rolled open-hearth steel. The rotor is of small diameter, which reduces the flywheel effect and tends to make the motors particularly adapted for frequent starting, stopping and reversing. In the design and construction an effort has been made to facilitate repairs in case of accident and combine maximum strength with a reduction in weight and over-all dimensions.

Bethlehem's New Electric Steel Plant

Its Girod Furnace in Operation— Hot Metal to Be Refined and High Carbon and Alloy Steels Produced

The Bethlehem Steel Company has just taken out the first heat from the 10-ton Girod electric steel furnace at its plant at South Bethlehem, Pa. The furnace is the largest of its type in this country and is expected to become a valuable adjunct of the Bessemer converter and the open-hearth furnaces as a means of refining the molten steel. Plans call for three such furnaces in the completed plant, which will make it one of the largest in this country.



Looking Down on Bethlehem's 10-Ton Girod Electric Steel Furnace Showing the Three Electrodes and the Electrical Connections.

An article by Paul Girod, the inventor of the furnace, appeared in THE IRON AGE of May 27, 1909, descriptive of the furnace and its advantages. The following description of the electric furnace department at South Bethlehem is furnished by the company's engineering department:

The electric furnace department of the Bethlehem Steel Company was planned in 1912, in connection with new open-hearth department No. 3 and other extensions. When completely equipped it will contain three furnaces of 10 gross tons capacity each per charge, or 36,000 gross tons capacity per year. At present, however, only one furnace has been constructed and installed. Among the several types of electric furnaces which were in use in 1912, the Girod furnace as perfected by Paul Girod, Ugine, France, was considered the most satisfactory with regard to economy and reliability.

The electric furnace building is 168 ft. long and 58 ft. wide, served by a 30-ton crane. The charging platform, which is elevated 12 ft. 3 in. above floor and yard level, extends 14 ft. 6 in. beyond building columns along the outside of building wall. On this extension there are covered bins for refractory materials, flux, ore, alloys and scale, these materials being unloaded from railroad cars and stored.

The furnace proper, which is located above charging platform, is cylindrical in form and made of ¾-in. steel plate, approximately 15 ft. in diameter and 5 ft. outside depth, with laminated outside plates ¾ in. thick. It is equipped with one heavily lined, counterbalanced charging door, sliding in a water-cooled frame. The pouring spout is directly opposite. On the side of the shell heavy copper angles are attached to which are electrically connected laminated copper bars conveying current from transformers.

The furnace proper rests on heavy cast-iron rockers running on rollers supported by rocker frames anchored to concrete foundation. The tilting of furnace is accomplished by means of worm drive, actuated by a 15-hp. reversing motor. The furnace can be tilted toward the charging side to discharge the slag through a notch in charging door, or toward the pouring side to pour the molten metal into a 12½-ton ladle located in the pit in front of the furnace, as shown by an illustration. The lining of the furnace can be either acid or basic. The bottom, 20 in. in thickness, will be made of double shrunk magnesite or dolomite well rammed in, the latter material being also used to patch up holes and make repairs to the bottom. The metal bath is approximately 16 in. deep.

Fourteen soft steel electrodes approximately 3½ in. in diameter are connected electrically to the bottom of the furnace shell, the lower ends of which are water-cooled. The roof construction, which is arched, consists of 9-in. silica brick, insulated from the magnesite brick of the hearth walls by means of asbestos plates, with provision for reception of three 18-in. electrodes with working length of approximately 6 ft. The electrode holders are made of copper and are water-cooled.

Ample provision has been made for adjustment so that electrodes can be adjusted and centered firmly and speedily. Two laminated copper bars carry the current from the transformer to the contact pieces extending from the electrode carrier. The lowest point of an electrode during operation of the furnace will be approximately 4 in. above the surface of the metal bath.

The electrodes are raised and lowered by means of a revolving screw spindle centered in the structural column, which is driven by a 5-hp. motor, mounted at the foot of the column, or, if necessary, it can be operated by means of a hand crank. The total weight of one electrode-carrying column and arm is approximately 2600 lb., the weight of an electrode proper being about 1000 lb.

The motors employed for this work are reversible, interpole type, using direct current at 230 volts, equipped with automatic speed regulation. The total weight of the furnace is approximately 90 gross tons, which includes about 35 gross tons of refractories.

About 1500 kva. per hour of 3-phase alternating current, 25 cycles, 65 to 80 volts, are furnished

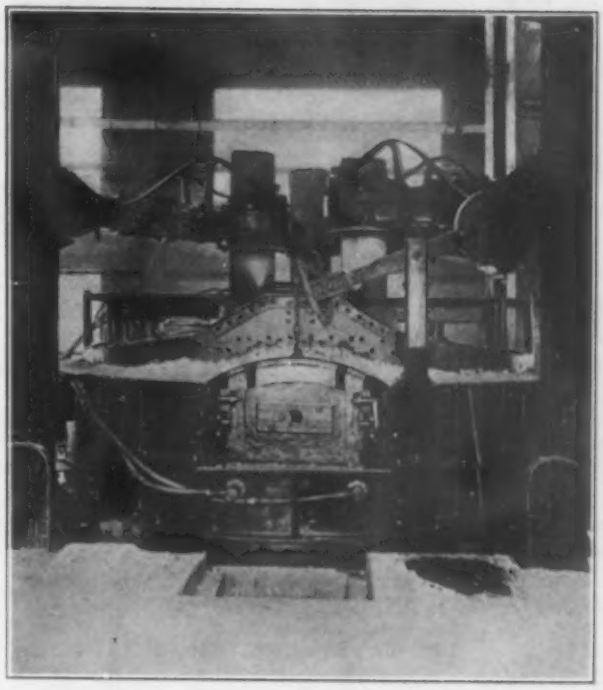
to the electric furnace, each carbon electrode receiving one phase of a 3-phase current, the conducting hearth of the shell acting as the neutral point. Special care has been taken to prevent the formation of induced currents in the shell and the roof frame, and to prevent sparking in the bus bars at the lower end of the electrode-carrying column, to that column in electrical contact with the shell.

The current is conveyed to the furnace from three oil-cooled single-phase transformers of 700 kva. each. It is generated by Bethlehem gas engines driving 2500-kw. generators, producing 3-phase alternating current of 6600 volts and 25 cycles. One reactance coil of 106 kva. capacity has been provided for the protection of each transformer. A special controller for each electrode is mounted in front of the switchboard, and one controller near pouring side for the operation of the tilting motor. The transformers are sheltered in rooms underneath the charging floor on both sides of the furnace, while the reactance coils and oil switches are in another room. The high-tension conductors are well insulated cables, the low-tension conductors are heavy bus bars laminated only where flexibility is required.

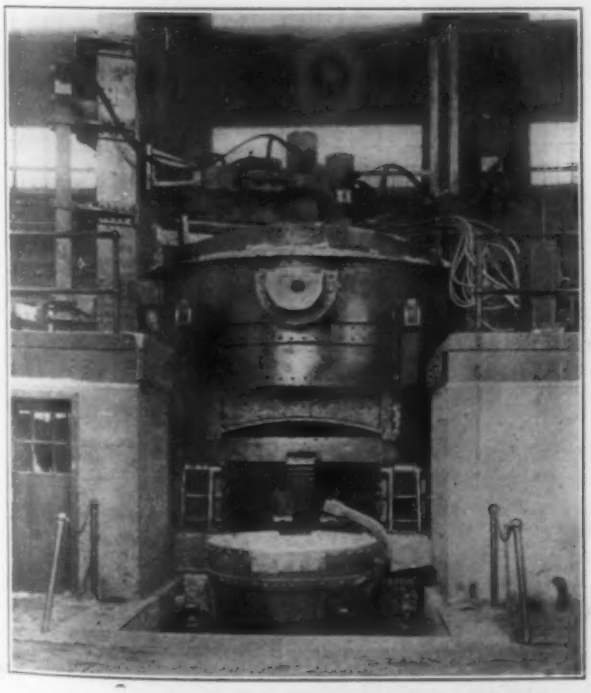
Of the 700 kva. leaving the three transformers, about 620 kva. actually reach the electrode holder, the balance beting lost in the form of heat through water-cooling, etc. The consumption of cooling water at the furnace is not expected to exceed 20 gal. per minute.

The yield from cold charge to finished product will be from 93 to 95 per cent. These men will be required for the operation, including the transformer man. Ladle drying facilities have been provided, also a casting pit 9 ft. wide by 20 ft. long. The slag will be dumped into a 60-cu. ft. slag car of special construction, 3-ft. gage.

A thoroughly equipped laboratory erected for the open-hearth department, which is adjacent to the electric furnace department, will take care of the necessary testing of steel, etc. The electric furnace will become a valuable adjunct of the Bessemer converter and the open-hearth furnaces as a means of refining the molten product they yield. The electric method is to supersede the more expensive crucible method in the production of high carbon and alloy steel. The electric furnaces are located in line with six 50-ton open-hearth furnaces, a 400-ton mixer, a proposed 10-ton converter and spiegel cupolas. It will be possible to transfer metal from either the open-hearth, hot metal mixer, converters or cupolas to the electric furnaces, thus giving a very flexible operation and wide variation of product.



The Charging Side of the 10-Ton Girod Electric Furnace of the Bethlehem Steel Company.



The Tapping Side of the Girod Electric Steel Furnace at the Bethlehem Steel Company's Plant, Showing Its Elevation Above the Floor and the Pit for the Ladle.

A Convenient Hardness Measuring Instrument

Under a license agreement granted by the metallurgical department of the Standard Roller Bearing Company, Herman A. Holz, 50 Church Street, New York, is manufacturing a portable instrument to determine the Brinell hardness of metals and metal products. The instrument, which is known as the Brinell meter, is designed to give accurate results independent of the dimensions, shape and location of the material tested. The main portions of the instrument are a housing with a removable steel ball 10 mm. in diameter and a detachable standard bar corresponding to a certain Brinell hardness number, which has a smooth surface in contact with the ball. These standard bars are supplied for any desired range of hardness, irrespective of whether steel, alloy steels, cast iron, brass, copper, aluminum, etc., are to be investigated. They are of square cross-section ½ in. on a side and 6 in. long. The four surfaces are machined, thus enabling them to be utilized, ground off and used again, the process being repeated several times, so that each bar can be used for several hundred tests.

In determining the hardness of the material under test the housing containing the standard bar and the metal section being investigated are placed so that when pressure is applied a spherically shaped impression is produced in both. The diameters of the indentations produced simultaneously in the two pieces of metal are measured by special scales and the hardness of the two metals, which is in direct relation to the proportion of the two indentations, is determined from direct-reading tables supplied. It is pointed out that as the test used is a comparative one, the pressure applied may be varied without impairing the accuracy of the results. The outfit consists of the housing, six standard bars, twelve steel balls, measuring scales and a set of tables giving the Brinell hardness numbers. In addition the meter can be used as a hardness gage for checking the hardness of metal purchased under specifications.

Outlook for the Steel Industry of France

Labor Is Inefficient but the War Has Brought an Awakening and French Exports May Become a Larger Factor

BY H. H. CAMPBELL

France does not possess any beds of rich and pure iron ore that can be compared with the ores of Lake Superior or the West Coast of England, and no coal deposits equal to those of Connellsville or Durham; but in olden times ironmakers did not require large supplies of raw material, for pig iron was made with charcoal, while almost any kind of coal would serve for a puddling or a heating furnace. Thus, we find old iron plants at many places throughout France, from the hills of Lorraine to the slopes of the Pyrenees, and from the plains of Normandy to the valley of the Rhone, the best known of these being at Creusot.

THE CREUSOT STEEL WORKS

The coal around Creusot contains 14 per cent of ash, and will not give a coke fit for use in the blast furnace unless it is mixed with better coal. The nearest good ore is in the minette field, and that is 200 miles away as the crow flies, while it is really much farther, because the railroads run east and west on account of the configuration of the land. Foreign ore has been used, but this must come by water from Spain or Algeria and then 250 miles by railroad.

Two years ago we would have said that there was no justification for a steel works being in such a situation, but we do not think so to-day, for French cannon and other munitions of war are made at Creusot, and it is the safest place in France. If this plant had been situated in the steel district of the east or in the industrial center in the north, it would now be in the hands of the Germans. The United States may profit by this example.

ACID AND BASIC BESSEMER PROCESSES

We may take the year 1870 as the starting point for the steel industry as we now know it, for the acid Bessemer process had just come into use, and France adopted the converter very quickly; but as there was no pure ore in the whole country, it was necessary to bring it from Spain or Algeria. For many years there were acid converters in operation near Valenciennes in the north and at Creusot in the center; but the use of the acid Bessemer has almost ceased in France, and to-day it produces less than 2 per cent of the total output of steel.

The basic Bessemer process was started in England in 1878, and it was immediately taken up by Germany and Belgium; but several years elapsed before France put the basic converter on a commercial basis, for there were several unfavorable conditions. Germany had shown that the ore in the newly annexed province of Lorraine was well adapted to the new process, but, unfortunately, there were no important steel works in that neighborhood which were on French soil, the large plants in France being in the south and southeast.

Moreover it was supposed thirty years ago that Germany had the cream of the iron ore and that in French territory the beds were smaller and thinner, lower in iron and lime and higher in silica. To-day it is believed that France has as much and as good ore as Germany possesses, and perhaps has the better of the bargain, for it was found about the year 1900 that there were enormous deposits deep down in the ground. Shafts have been sunk, and the output has steadily increased, so that the whole situation has changed within the last ten or fifteen years.

In 1870 France made 16.2 per cent of all the steel produced in the world; in 1880 only 9.1 per cent; ten years later 6.7 per cent; while in 1900 the proportion was 5.6 per cent. But the tide changed, and in 1910 France made 5.8 per cent of the steel output of the world, and although this may seem a small gain, we must remember that the United States is about the only nation that is increasing its proportion. During the ten years from 1900 to 1910 Great Britain, Germany, Russia and Austria showed a loss in percentage, although they increased their actual output.

So, in trying to forecast the future, we should not put much weight on old conditions, but should consider the situation as it stands to-day. The spurt in the French steel industry during the last decade was caused by the development of the ore beds in what is known as the minette district, which was described by the writer in THE IRON AGE of July 15, 1915. We will take a look at this ore supply and then see how much coal is available.

THE ORE SUPPLY

Almost all the iron ore in France is in the province of Meurthe et Moselle, which is situated on the extreme eastern frontier. There are three separate ore fields: Longwy in the north, Nancy in the south, and Briey in the center, this latter district being only a few miles northwest of Metz. In most places the ore is near the surface, but in the Briey field there are large mines which are raising the mineral from a depth of from 500 to 800 ft. The Briey field is much the largest of the three and produces two-thirds of the output of the province, the whole district raising about 15,000,000 tons per year, or over 90 per cent of the total ore output of France.

Large amounts of this mineral are exported to Germany, Luxemburg and Belgium, but in 1913 the ore used at home accounted for three-quarters of all the pig iron and two-thirds of all the steel made in France. It is stated that there is sufficient ore to last a hundred years at the present rate of production, counting only the good ore, while in addition there are large reserves of inferior quality.

CHARACTER OF BRIEY ORE

This ore from the Briey field is of fairly regular composition, but it may be divided into two grades, the rich and the poor, as shown in Table A. Both of these grades contain a considerable proportion of combined water and carbonic acid, and it has been proposed to roast the ore that is to be exported to England; the poor ore, however, is so rich in lime that the calcined product is too friable to withstand handling, and so this will be used at home. If we suppose the lime is taken away, there will be considerably over 50 per cent of iron in the roasted ore, and since the lime is valuable as a flux, it is plain that we have a desirable ore.

Phosphoric acid is present in such proportion

that the pig iron contains about 1.70 per cent of phosphorus and the iron is used almost altogether in the basic Bessemer converter.

Table A—Composition of Briey Ore

Note: The ore as mined contains about 10 per cent. of moisture.

	Loss on Ignition	Silica	Lime	Iron
Dried at 212 deg. F.				
Rich ore	18.00	6.50	10.00	40.00
Poor ore	20.00	6.50	16.00	33.00
Calcined				
Rich ore		7.50	12.00	48.00
Poor ore		7.50	20.00	42.00

THE COAL SUPPLY

The only reasonably good coal in France is in the most northerly province where Valenciennes is situated, but even here the coke made is of inferior quality, while the supply is not equal to the demand. The coal beds have been disturbed by geologic convulsions and in one place the older Devonian and Silurian strata are folded and thrust over the coal measures with a horizontal displacement of nearly two miles, so that mining operations are difficult and dangerous. It is not surprising, therefore, to find that large quantities of English coal are imported into this very province of Pas de Calais and that fuel is expensive throughout France.

In order to reach the ore district, coal must be hauled 150 miles from Valenciennes, but Belgian coal is much nearer, while the mines of Saarbrucken in Germany are only 50 miles away in a straight line, or about 75 miles by railroad, so that a large proportion of the fuel is imported.

There is a tariff on coal, which increases the cost of iron in France and therefore the cost of steel; and by just that much her manufacturers are handicapped in seeking for export trade. France is grievously tax-ridden; but as far as known no one has yet proposed a direct tax on pig iron smelted, or on rails rolled; so they have something yet to learn from the United States.

THE STEEL DISTRICT

Most of the steel made in France is manufactured near the ore mines in the province of Meurthe et Moselle, about two-thirds being made by the basic Bessemer process and the rest in the open-hearth furnace. This province is crowded into a *cul de sac* formed by Germany, Luxemburg and Belgium, and this limits the available market. To the south is the mountainous area of southeastern France; to the southeast is Switzerland, which is nearer to the steel works of Germany; to the east is a line of German steel works extending from Saarbrucken to Aix-la-Chappelle; while on the north is Belgium which, instead of offering a market, exports a large proportion of its steel output.

As a result of these conditions, nearly all the iron and steel made in eastern France must be carried westward right past the coal mines at Valenciennes. If these coal fields could supply cheap coal we would have very favorable transportation conditions, because there would be practically the same weight of material shipped from the coal mines to the steel works as would come back from the steel works to the coal mines; but this relation is upset by the use of coal from Belgium and Germany.

A glance at the map will show that France is just as well situated as Germany, as far as railroad haulage is concerned, for Belgian and German coal are both within 100 miles of the ore mines; while it is only 250 miles from the steel works on the eastern frontier to the docks of Havre, and a less distance to Boulogne.

RAILROADS

The distances through which material must be carried would be considered very moderate in America, but the French railroads are managed most lamentably. The American tourist who travels from Cherbourg to Paris finds that there are trains in France equal to any that we have here, and it would be natural to suppose that ordinary trains in that country differ from these special trains, just as our accommodation trains differ from our limiteds. A very slight experience, however, will prove that just as soon as we leave the trains de luxe we enter a new physical and mental world. This is not the place to enter into a discussion of the railroad system of France, but it must be said that if the steel works in the east have to do business under the same conditions that obtain in the rest of the country they are under a great handicap.

LABOR CONDITIONS

The French steel makers have also to contend with the peculiar psychology of their workmen. France turns out some of the finest qualities of steel, while the very best scientific instruments are made in that country; but the men will not work hard. It is a marvel to an American engineer how the French steel works can operate at all, when there are so many men walking aimlessly around with nobody doing a day's work.

The answer is that the wages are low, while manufacturers of every kind are protected by high tariffs. Wages would be raised voluntarily by employers if the workmen would increase their output; but they refuse to do more, no matter what chances are given them on piece work, for they aim to earn just so much a day and have no ambition to earn more. In THE IRON AGE of Dec. 2, 1915, there was an account of the experience of William F. Carmody of Chicago in a French workshop and the article states that the French mechanic knows nothing about working under pressure and that apparently he is unfit for it temperamentally.

All this was true not long ago, but we read that during the last year the rate of production in some munition factories has been increased anywhere from 10 to 100 fold, which would hardly seem possible unless former conditions are taken into consideration. It is said that this war is waking up the French people, and so it may be that in the future we may face competition from a nation which thus far has not taken a leading part in the international iron trade.

FOREIGN INVESTMENTS

France has about $10,000,000,000 invested abroad which brings in something less than $500,000,000 per year, overcoming an unfavorable trade balance, which in 1912 amounted to $293,000,000. In addition to these dividends on foreign investments, there is an invisible credit item coming from the money spent by visitors from England, America and all the world, so that France has been getting richer every year in spite of the imports exceeding the exports.

It was stated in a former article that the foreign investments of Great Britain were in mines, railroads and industrial enterprises of all kinds; but the French investments are of a different character, being composed mainly of government bonds, the national debt of Russia, for instance, being about all owned in France. Consequently these investments do not create business for the workshops of France in the same way that the foreign activities of Great Britain bring a steady stream of orders to British factories. It is to be expected that in the future

France will see that her foreign loans bring trade to her mills, because every franc will be needed in that period of industrial depression which it would seem must come sooner or later after this struggle is over.

SUMMARY

We have seen that France has a large deposit of good iron ore on the eastern frontier and one fair bed of coal, although this does not supply fuel enough for the needs of the country. Railroad management is bad, while French labor is inefficient and capital is timid for fear of confiscation by socialistic legislation.

France thus far has taken little part in the foreign iron trade, although her steel works have supplied domestic requirements, because they have been protected by a high tariff. It is known by everybody that this war has aroused the French people from their lethargy, and her manufacturers have lately been in the United States and have acknowledged that they must get the newest machinery and that France must improve her methods. It is possible that after the war they will take a larger share of the foreign trade and that the great ore deposits of Meurthe et Moselle will be the foundation of a prosperous export trade.

IMPROVING THE PERSONNEL

New Methods of the Fore River Shipbuilding Company, Particularly in Employing Men

At a conference of the Employment Managers' Association of Boston, May 10, H. G. Smith, general manager of the Fore River Shipbuilding Company, Quincy, Mass., gave an address upon the methods used to improve the personnel at the company's works. His remarks are abstracted below:

It was recently determined to see what could be done to improve the quality of employees and to increase efficiency at the Fore River shipyard, which is now undergoing rapid expansion, with the addition of new plant for the production of war and merchant vessels. A committee of employees was carefully selected and sent to inspect fifteen large manufacturing plants in the Middle West, including shops in Pittsburgh, Cleveland, Detroit and Columbus, besides Philadelphia in the East, the object of the committee's visits being to obtain as much information as possible relative to both personnel and plant betterment.

A TOUR OF OTHER SHOPS

On the committee were the head of the welfare department, a representative of the office staff, a skilled mechanic and several foremen. The mechanic was appointed in the belief that the ideas gained on the trip would, through his agency, be disseminated more effectively among the employees' ranks. The committee carried a questionnaire and at the close of each day dictated a summary of the day's observations to a stenographer and mailed them to the home office, thus enabling the executives to keep in close touch with the progress made and be better informed as to work accomplished by the time the committee returned.

Upon their return the members of the committee were called before the board of directors. All were enthusiastic over what had been seen on the trip and prepared to submit many ideas in behalf of plant and personnel improvements. A report was prepared and a summary printed, the latter then being sent to 200 men in leading capacities in the plant. Comments were received in return from 167 of these men and in 140 cases the comments were of considerable length. A final summary embodying the consensus of opinion of the individuals consulted was then drawn up, and with this as a basis many improvements were set about.

A NEW EMPLOYMENT BUREAU

One of the most important questions was the necessity of establishing a new employment bureau. The opinion was almost unanimous that this should be done, placing the hiring of men on a higher plane than in the past. Many comments were received as to the best type of building for this purpose, a separate structure being suggested. Methods of "weeding out" undesirable applicants were considered, together with the maintenance of an eligible list. The company is now preparing to construct this building, which will provide comfortable quarters under cover for applicants, with opportunity for each man to talk confidentially with the employment clerk. All prospective employees are given a physical examination, and one of the points made in the recommendations was that anything that can be done to expedite the physical examination is worth while, with the added suggestion that it include advice on attaining higher standards of health in cases where there as an initial failure to pass.

A little attention which is much appreciated by the new employee is the simple practice of sending some one with him to the department to which he is assigned, rather than expecting him to flounder about the shops in search of his berth. This courtesy gives the new employee a conception of his importance to the company which is worth while. The company has selected an employment clerk after careful consideration of the qualifications of five or more men for this work. It is believed that an eligible list of prospective employees should be carried at all times, including the names of men whom existing employees know about as potential good men for the company. Another point brought out in the recommendations was the importance of telling a new employee at the time of his acceptance exactly what his rate of pay is to be, and when the stated wage rate will begin.

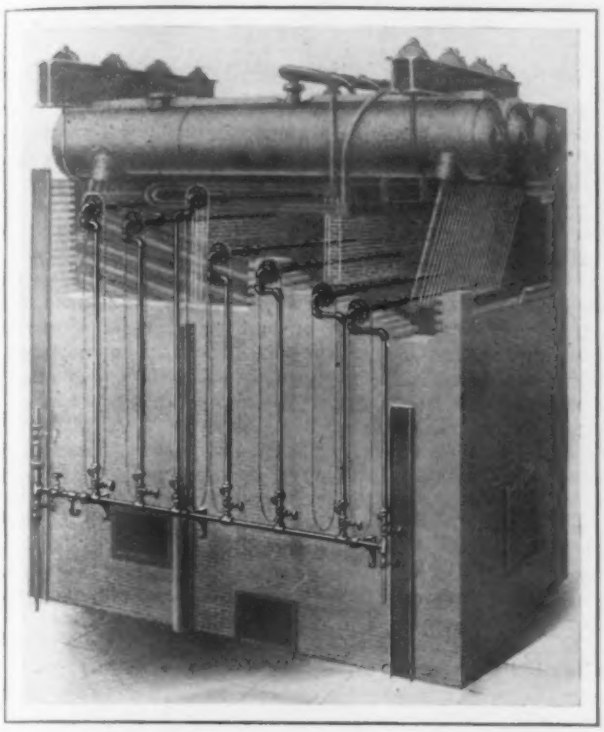
Analysis of discharges and "quits" is now more thoroughly carried on at Fore River than before, and a practice favored by the committee is for the employment manager to take a personal interest in the new employee in the endeavor to see that his work goes well and that he has nothing on his mind which ought to be made known in the interests of a more perfect adjustment to his surroundings. Promotions from the ranks, with the establishment of a board of appeal in case of trouble with foremen, were also favored. As to pensions, the committee viewed the general idea with favor, but urged extreme care in putting any scheme into effect. Other points discussed as a result of the committee's trip were a company library, welfare work, the employment of a visiting nurse, safety propaganda, the co-operative store, works paper, and lunch room. The cafeteria style of lunch room was adopted with the result that 225 men can now be fed from a short counter in nine minutes, compared with half as many under the old arrangements. The formation of clubs, entertainments, an annual field day, hospital improvements, and the compiling of a book of information for the use of new employees were also discussed and put into effect. Closing, Mr. Smith pointed out that an employee receiving $1,000 a year represents an investment of $20,000 at 5 per cent interest, and emphasized the importance of doing everything possible to increase the efficiency of an establishment's personnel, in the light of this consideration.

Employment of Women in Germany

The number of persons engaged in the German industries in January, 1916, was about 9.3 per cent below the peace-time average. The greatest increase is in mining and in the chemical, iron, metal and engineering industries, but only in so far as the works affected are making war material. This is in line with a review of the labor market in the German empire in January, 1916, published recently by the government and based on reports from 39 industrial associations and 442 business undertakings. Of the latter, 362 firms employed an aggregate of 312,105 hands, compared with 270,148 in January, 1915. The increase consists almost entirely of women, the men employed being only 11,000 more than a year ago and made up largely of prisoners of war or inhabitants of occupied territory.

A Soot Cleaner for Horizontal Boilers

A soot cleaner using a combination of steam and gas currents, which are concentrated successively on each part of the surface to be cleaned, has been developed by the Vulcan Soot Cleaner Company, Du Bois, Pa. It is designed for use with any boiler. Two features



A Horizontal Tubular Boiler and Superheater Equipped with a Soot Cleaner Utilizing Steam Jets at an Angle of 60 Deg. to the Horizontal Plane Which Can Be Swept Through a Wide Arc

emphasized are the anti-corrosion air relief valves, one of which is used for each element of the cleaner, and a tell-tale drain valve located on the main header.

The steam jets are directed along diagonal paths at an angle of approximately 60 deg. to the horizontal. The cleaner element is mounted on bearings and rotated by a chain and sprocket wheel outside the setting. The element consists of a horizontal length of pipe projecting into the boiler with nozzles mounted upon it. This arrangement, it is explained, causes the jets of steam discharged from the nozzle to sweep through a wide arc, concentrating their cleaning and scouring action on each portion of the tube surface.

A main steam header is installed along the length of the boiler with risers and automatic ball check valves for each element. These valves are relied upon to eliminate the internal corrosion of the outside valves and piping. Otherwise, when an operating valve was closed, the steam contained in the riser condensed and sulphur-laden furnace gases reached the piping interior. With the present arrangement the valve check opens slightly and admits air to restore the balance of pressure.

The automatic drain valve on the main steam header is of similar construction to the air relief valve but is larger. It is relied upon to discharge any small amount of water which may leak into the header from the steam connection and thus to prevent the header from becoming filled with water of condensation which would be blown into the boiler when the cleaner was operated again.

A cleaner developed for the Stirling boiler has a series of special elements for the first tube bank where the temperatures are high, and precautions must be taken to avoid burning out the parts.

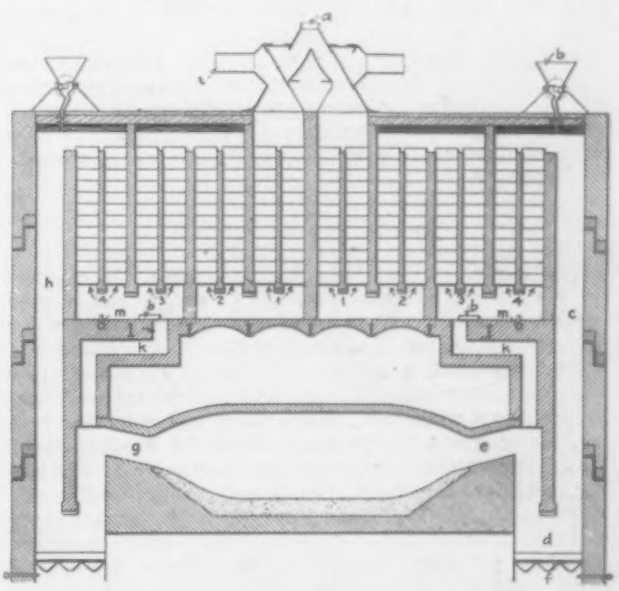
The Goldschmidt Thermit Company has removed its main office from 90 West Street, New York, to the Equitable Building, 120 Broadway.

Regenerators Above an Open-Hearth Furnace Using Powdered Coal

A new way of using powdered coal in open-hearth furnaces has been devised by John E. Bell, New York. It is the subject of a patent (U. S. 1,170,397—Feb. 1, 1916) and is designed to increase the fuel economy, reduce the space occupied and permit more perfect control of the furnace as to temperature and character of flame or heat. It is stated that by thus utilizing pulverized coal it need not be crushed to the fineness heretofore necessary. The distinctive feature of the invention consists in placing the regenerators above the furnace proper, as shown in the illustration, and within the same walls. The general idea for operating the system is as follows:

Air is blown through *a* from a blower, passing through the successive parts of the right-hand generator 1, 2, 3 and 4, respectively, with the valve open as shown. Pulverized coal is fed in at the same time at *b* in the separate combustion chamber *c*. Here the falling coal and preheated air unite, the coal burning to form producer gas, which passes under the arch or wall *d* and up through *e* to the hearth of the furnace. The ash, as it forms, collects on the grate *f*, where steam or steam and air are introduced to promote the consumption of any unburned carbon and to prevent the formation of clinker. The gases pass out at *g* and up through the chamber *h* to the second or left-hand regenerators, from whence they pass out at *i* to the stack. Upon reversal the coal is stopped at *b* and is allowed to re-enter on the opposite side.

By introducing auxiliary heated air through the passages *k*, a secondary combustion may be effected, the amount of air being regulated by the check damper *l*. Steam may be admitted at the two points, *m*, so as to regulate the temperature of the regenerator, or water tubes may be inclosed in the furnace walls to take up some of the heat. The re-



The Arrangement of the Regenerators and Flues for an Open-Hearth Furnace Burning Powdered Coal.

generators may be placed below the furnace or at one side.

Considerable economy in fuel, low stack temperature and efficient combustion with long controllable flame are claimed for the arrangement.

The Meaker Company, Fulton Street, Chicago, has changed its name to the Meaker Galvanizing Company.

Machinery and Supply Men at Pittsburgh

Triple Convention a Great Success—Attendance Nearly 1000—Pittsburgh Sets a New Pace for Convention Entertaining

The triple joint convention of the American Supply and Machinery Manufacturers' Association, National Supply and Machinery Dealers' Association and Southern Supply and Machinery Dealers' Association, held at Pittsburgh May 10, 11 and 12, was attended by nearly 1000 persons.

For several reasons the convention was one that will linger long in the memory of those who attended. No section of the country had anything to report but prosperity, the Southern organization was again meeting with the manufacturers and Northern dealers after a lapse of three years, while ever present was the lavish provision which Pittsburgh had made for the comfort and entertainment of its guests. No detail seems to have been overlooked, even to supplying the vistors with their morning papers. The registration bureau was conducted like a well-ordered office, and the machinery of the entire convention moved with precision. Even the weather was fine, and it was proved that the sun does shine over Pittsburgh, also that the sky is blue, a fact which Robert Garland emphasized.

PITTSBURGH COMMITTEE OF ARRANGEMENTS

The Pittsburgh convention committee consisted of Col. H. P. Bope, Carnegie Steel Company; George T. Bailey, Oliver Iron & Steel Company; Charles J. Graham, Graham Nut Company; Charles L. Wood, Carnegie Steel Company; G. E. Benson, National Tube Company.

Following are the chairmen of sub-committees: Automobiles, J. E. McLain, Cambria Steel Company; banquet, A. M. Harper, Carnegie Steel Company; finance, H. B. Wheeler, American Sheet & Tin Plate Company; hospitality, J. M. Hansen, Steel Car Forge Company; ladies' entertainment, C. M. King, McKinney Mfg. Company; publicity, E. S. Rooney, Youngstown Sheet & Tube Company; reception, J. F. Hazen, Pittsburgh Steel Company; speakers, W. L. Rodgers, Pittsburgh Gage & Supply Company; dinner vaudeville, W. W. Sanderson, Carborundum Company.

On the general committee were well over 100 men associated with the iron, steel and machinery interests of Pittsburgh.

Joint Opening Session

As stated in THE IRON AGE last week, the conventions opened Wednesday morning, May 10, with a joint session at which addresses of welcome were given by Charles J. Graham, Graham Nut Company, Pittsburgh; Robert Garland, a member of the City Council, and Frank J. Lanahan. Mr. Garland laid stress on Pittsburgh as an art, music, educational and scientific center, doing great things apart from the production of steel. Appropriate responses were made by J. G. Belding, president Southern Supply and Machinery Dealers' Association; H. W. Strong, president National Supply and Machinery Dealers' Association, and Farnham Yardley, president American Supply and Machinery Manufacturers' Association. Mr. Strong said the associations had probably never met at a time when conditions were as good as they now are in every section of the country, but that it was well to look to the future and to be unremitting in studying the problem of what it costs to do business. Mr. Yardley likewise remarked that the meeting was held under auspicious circumstances, also that it was held in a city famous for its big way of doing things and in a hotel worthy of Pittsburgh. He referred to the splendid new William Penn Hotel. A short address was made also by A. J. Bihler, J. C. Lindsay Hardware Company, Pittsburgh, president National Hardware Jobbers' Association.

WORK OF THE NATIONAL CHAMBER OF COMMERCE

The principal address of the joint meeting was given by R. G. Rhett, president Chamber of Commerce of the United States of America, who explained the scope and purposes of the body he represented, whose strength rests on the support given by associations such as he was addressing. He briefly sketched the vast change which has come in the application of power in the past 50 years—a period in which man has come to grasp and apply the forces of nature. He said that in earlier days competition had been found a great constructive force, but that more recently co-operation had been found to be a more powerful and even more constructive force. Competition was good until it levied unfairly on mankind, and the same is true with co-operation. It is good until it resorts to practices which render it destructive. There has been much confusion in recent years; evils have come into existence which have excited much feeling, and a more or less hostile attitude has been held toward all big business. Meanwhile organized labor has been fighting for better conditions, and so effectively that to-day labor is exerting great influence on national and State legislation.

It was in view of these conditions that the National Chamber of Commerce had been organized—to enable manufacturers to get together on a higher plane and to regain their prestige. A duty to be performed is that of arousing business men to the point where they will unite and hold their own with other classes. Mr. Rhett's references to class legislation elicited hearty applause. He explained the various activities of his organization, and its plan of sounding public opinion by referendum votes stretching over the entire country, one of these getting light on the wisdom of establishing a league to enforce world peace. Other subjects with which the Chamber had concerned itself included the seamen's act, resale prices, vocational education, national defense, and the threatened railroad strike. It had been determined by a committee representing the public that the Interstate Commerce Commission should investigate the railroad situation. He concluded by saying that co-operation as a great cohesive force should be permitted so far as can be possible without injury to the public. Court decisions were often conflicting, but they were all tending in the direction of permitting a legitimate drawing together of the forces making for business welfare. Mr. Rhett was heard by a large audience, which showed its appreciation of his address by a rising vote.

Second Joint Session

The three associations, again in joint session, on Thursday afternoon, were addressed by Daniel V. Stephens, member of Congress from Nebraska. His subject was the Stevens bill for the legalizing of contracts for the maintenance of resale prices. The welfare of the people, he said, is wrapped up in the success of business. If the Stevens bill is enacted into law it simply will mean that business men will practice what they always practiced before there came a well-known court decision—a decision he believed to be a mistake, inasmuch as it was based on the old common law that when a title passes all control passes with it. The way out, he said, was to modify the statute on which the court based its decision. He wanted it understood that he had high regard for the courts; he believed that while the American courts were as nearly perfect as any in the world, yet, after all, they were human.

Only the manufacturer of an article knows at what price it should sell and if, by chance, he asked too much

there would be someone to take his business away from him. With all respect for the courts, he believed that they were incapable of regulating business, and their attempts to do so have constituted a millstone about the neck of business. Courts have not the machinery essential to handling business; furthermore, the men handling the courts are professional men, and do not have the knowledge to enable them to handle business. Mr. Stephens said he had great faith in the Federal Trade Commission as it is a step in the right direction. Incidentally, he vigorously condemned unfair methods, and he was accorded much applause when he said that business built on trickery should not be tolerated. In this connection he said that every man should be encouraged to put his name on his goods, as it stimulates pride in the manufacturer and when it is done his interest does not cease with the sale. In closing Mr. Stephens said:

The bill simply gives each individual producer the right to say what price his own brand will sell for to the consumer. It is the right every man has now when it comes to fixing a price on his own labor, and to deny labor the right to fix the price it chooses on its own product when it takes the form of a trademarked or branded article is an absurdity in a free country. If the price is too high, it won't sell and the price will come down. The people are only compelled to pay the price in case of monopoly, and this bill is the bitter enemy of monopoly. It stands for the rights of men who earn their bread in the sweat of their faces and those who meet a payroll every Saturday night.

H. E. Dickerman, Chisholm-Moore Mfg. Company, Cleveland, Ohio, elected president of the American Supply and Machinery Manufacturers' Association.

Herbert W. Strong, Strong, Carlisle & Hammond Company, Cleveland, Ohio, re-elected president of the National Supply and Machinery Dealers' Association.

Ernest Howell, Capital City Supply Company, Charleston, W. Va., elected president of the Southern Supply & Machinery Dealers' Association.

On motion of Willard Parker, Pennsylvania Shafting Company, Spring City, Pa., a resolution was passed by rising vote deploring the death, several months ago, of Elmer Crawford, president Crawford Publishing Company, Chicago, an associate member of the American Association.

Major W. H. Banks, Banks Supply Company, Huntington, W. Va., made an appeal to the manufacturers to agree on a fixed date whereon list prices would be changed, also that the changes be made but once a year. These prices had been changed so frequently that expensive catalogs issued by jobbers quickly became useless. In one instance, 30 list prices were erroneous two and one-half months after the printing of the catalog. The matter was taken under advisement.

All three organizations held their first business sessions Wednesday afternoon, each going into executive session.

First Session of Manufacturers

At the first session of the American Supply and Machinery Manufacturers' Association, the retiring president, Farnham Yardley, Jenkins Brothers, New York, presented his report reviewing the association's activities, and stating that it was in every way in a flourishing condition, At the close of his address he gave voice to a sober word of caution relative to the individual business interests of the members which he believed to be appropriate. In part he said:

Before the war it had for some time been strongly indicated that production in this country was so far exceeding consumption that a foreign outlet for our surplus production was becoming imperative. Now, in the twinkling of an eye, as it were, we are confronted with the extraordinary spectacle of consumption far exceeding production, a situation completely reversed in a year. The spirit of caution, which was so strongly prevalent with the chaotic uncertainty of a year ago, is in grave danger of being supplanted by a false sense of security and optimism, for prosperity tends to dispel memories of adversity, and swelling profits make strong the temptation to expand with the visions of immediate business activity.

Let us not forget that our material good fortune of the present is built upon the misfortune of other people. The evils of over-expansion are never apparent when the conditions which cause it continue to exist; now is a time for optimism, but it is no less a time to adhere to the principles of conservatism which will safeguard the profits which have come our way rather than to sink them in enterprises which later on may bring no return and be productive of expense rather than income.

The report of the Auditing Committee was presented by C. H. Jenkins, Moran Flexible Steam Joint Company, Louisville, Ky., after which the report of F. D. Mitchell, secretary-treasurer, was received. The latter stated that 49 new members had entered the association in the year. After these and other formal reports had been received, President Yardley appointed the following convention committees:

Nominating—S. P. Browning, Ohio Valley Pulley Works, Maysville, Ky.; I. R. Bailey, Goodyear Tire & Rubber Company, Akron, Ohio; C. W. Beaver, Yale & Towne Mfg. Company, New York; N. A. Gladding, E. C. Atkins & Co., Indianapolis, Ind.; Richard R. Hicks, American Steam Pump Company, Battle Creek, Mich.; C. H. Jenkins, Moran Flexible Steam Joint Company, Louisville, Ky.; Willard Parker, Pennsylvania Shafting Company, Spring City, Pa.; D. K. Swartwout, Ohio Blower Company, Cleveland, Ohio.; Paul D. Wright, Reed Mfg. Company, Erie, Pa.

Resolutions—S. P. Browning, Ohio Valley Pulley Works, Maysville, Ky.; J. H. Williams, J. H. Williams & Co., Brooklyn, N. Y.; Charles E. McFarlan, William Powell Company, Cincinnati, Ohio; S. P. Woodard, New Jersey Car Spring & Rubber Company, Jersey City, N. J.; E. S. Todd, Clark Bros. Bolt Company, Milldale, Conn.

John Trix, American Injector Company, Detroit, Mich., took the floor to say that he believed the message of caution given by Mr. Yardley to be most timely, and on his motion it was voted that the address be distributed to the members in printed form. Mr. Trix further paid a high tribute to Mr. Yardley, and offered a resolution which requested the Nominating Committee to renominate him. The resolution was adopted unanimously, but it was without avail when the committee besought Mr. Yardley to accept a renomination.

IMPORTANT RESOLUTIONS ADOPTED

At the Thursday morning session of the American Supply and Machinery Manufacturers' Association a number of resolutions were reported by the Resolutions Committee, all of which were accepted unanimously. Among them were expressions of thanks to the Pittsburgh Convention Committee, to R. G. Rhett, of the Chamber of Commerce of the United States, to the Pittsburgh committee ladies, to the hotel management and the following:

Resolved, That this convention declare itself in favor of supporting the President of the United States in his diplomatic endeavors to settle the questions of international relationship now confronting this country.

Resolved, That this convention strongly indorses the plan of a permanent tariff commission as being the best method of putting the tariff on a business basis, and liberating it from political influence.

Resolved, That it is the sense of this association that an adequate preparedness for national protection is the best assurance of peace, and will best serve the interests of this country as a whole.

Resolved, That this association officially recognizes the unprecedented opportunities now existing in the export markets of the world for American goods, and that active steps be taken to create a collective endeavor on the part of our association to meet this world market, and co-operate for its permanent exploitation.

Recommended, That the president of our association be empowered to appoint a committee consisting of a chairman and two associates, said committee to be named the Export Committee, and to perform the functions of examining the export opportunities and disseminating among our members such information and advice as may be considered helpful to us individually and collectively.

N. S. & M. D. A.

Officers elected at the annual convention of the National Supply and Machinery Dealers' Association.

President, H. W. STRONG, Strong, Carlisle & Hammond Company, Cleveland, Ohio.

First vice-president, in charge of machinery interests, W. J. RADCLIFFE, E. A. Kinsey Company, Cincinnati, Ohio.

Second vice-president, CRANNELL MORGAN, Hardware & Supply Company, Akron, Ohio.

Secretary-treasurer, THOMAS A. FERNLEY, Philadelphia.

Advisory secretary-treasurer, T. JAMES FERNLEY, Philadelphia.

Executive Committee—W. T. TODD, Somers, Fitler & Todd Company, Pittsburgh, Pa.; GEORGE VONNEGUT, Vonnegut Hardware Company, Indianapolis, Ind.; E. B. HUNN, C. S. Mersick & Co., New Haven, Conn.; A. M. MADDOCK, Maddock & Co., Philadelphia.

PRESENTATION TO RETIRING PRESIDENT

After the election of officers R. F. Valentine, Standard Tire & Rubber Mfg. Company, Cleveland, Ohio, on behalf of the members, presented to Mr. Yardley, the retiring president, a pearl and diamond scarf pin. Mr. Yardley, in responding, said he believed in rotation in office, and took occasion to give A. E. Dickerman credit for having brought the convention to Pittsburgh, through his efforts to bring the three associations together again. Mr. Dickerman, Mr. Yardley, Mr. Valentine, Mr. Gladding and Secretary Mitchell visited Birmingham and Memphis in the past year with the purpose of bringing about a triple convention.

Mr. Valentine also presented a piece of jewelry to Secretary Mitchell as a token of the appreciation to which his work was entitled. Mr. Valentine was chairman of the Promotion Committee of the convention.

Charles J. Graham, Pittsburgh, offered a resolution placing the association on record as opposed to the multiplicity of conflicting Federal and State enactments regulating trade and transportation. He urged that greater publicity be given to the unfairness of existing conditions. The resolution was carried.

National Dealers Have Busy Sessions

As is usual at the annual meeting of the National Supply and Machinery Dealers' Association, the sessions were well attended, often protracted, and marked by intensive discussions of the problems which confront the dealer. President H. W. Strong, Strong, Carlisle & Hammond Company, Cleveland, Ohio, presided at all the sessions. Ample reasons for the intensiveness of the discussions which characterizes the meeting of the association were given by Mr. Strong in his annual address, which was, in part, as follows:

"There is to-day perhaps no line of business in the United States in which the amount of detail is as great as in the business of mill supplies. While the trade varies somewhat in different parts of the country, there is a great similarity in perhaps 80 per cent of the lines carried by supply dealers throughout the United States, and while the quantity of different articles of merchandise also varies considerably, it is perhaps true that the index of the catalog of most of the dealers in supplies will contain a list of from 3000 to 4000 different articles, a large majority of which they keep in stock and in all of which they deal.

"When it is recognized that any one of these lines in an index, such as 'Bolts-Machine,' may indicate goods of which 300 or 400 different sizes are carried, 'Screws-Machine' takes only one line in an index, but with round, flat fillister and button heads with sizes ranging from 3/16 in. No. 2 to 6-in. No. 30, and with from three to six different threads for each diameter, the number of different sizes of this one item mounts up into the thousands.

"In many of the lines the existence of two or more standards makes a very much greater amount of detail. . . . Square finished machined keys with heads are carried in stock by a great many dealers and the printed list calls for something over 500 sizes. Drills vary not only in diameters by sixty-fourths or one hundredths of an inch from very small to very large sizes, but they also vary in length and in number of flutes and in styles for different classes of work.

"Cutters vary not only in diameter, but in size of hole and pitch as well. Files vary in shape, size and cuts. Engineers' wrenches have been developed from a very simple line into a large and complex one, while lathe tools, which a few years ago were unknown, now spread over a good many pages of any man's catalog. Drill chucks vary not so much in kind or size as in the vast variety of manufacturers who furnish them, which perhaps is equally true of vises. This is also true of all kinds of small tools, the finer lines of which have been developed amazingly in the past twenty years. Yankee ingenuity has been busy during this time in devising new tools for old jobs and for new jobs as well until to-day the supply dealer is obliged to know a little about everything that is made to be able to talk on the latest designs in packings, tools, screws, cutters, etc., as though he were the manufacturer himself.

"And now, in addition to all the mechanical lines which we have been glad to add to our stocks from time to time, it is evident that there is a very determined effort being made to make us see that we are the logical distributers of automobile supplies. Whether it will be found generally to be advisable to add this large new line to the others that we have is beyond my power to say.

"With the above in mind and the knowledge which you all have of the supply business as one in which no

man ever really made a fortune, but in which there is, for a great many of us, a good livelihood based entirely on our ability to toil unremittingly and with intelligence, it must be very evident that every locality is bound to have problems arise among the distributers of mill supplies, light on which can be thrown by the distributers in some other locality where the same problems or similar ones have been worked out in the past. If the members would use the association for the acquiring of such information as this it would add vastly to the value of the association, to the value of each member's business and certainly to the peace of mind of your officers.

SOME PROJECTED RECOMMENDATIONS

"In addition to the activities of the association in the past year there have been several other suggestions made for branching out in the ensuing year, and among them are the following:

"1. Method of training young men in the supply business. It has been suggested that some standardization be made of methods for training the young men who come into the supply business so that the information can be made available for all of the members. It is known that there are several concerns in our membership which have given much thought to this problem.

"2. The development of various clubs among the employees. Some of our members have developed this idea to a considerable extent, and an investigation of this with the publishing of a report may be of great assistance to some of the rest of us.

"3. The employment of an accountant by the association. The idea here is to employ a highly experienced and accomplished accountant, who would be sent to various parts of the country indirectly to assist in increasing our membership and directly to inform the members of the supply trade who are not members of the association as to what their actual cost of doing business is.

"4. Some work along the line of putting into effect new prices on an advancing market as soon as they are made by the manufacturers. It has been very apparent in a good many parts of the country during the past very unusual year that the dealers' prices were lagging behind the advances made by the manufacturers. . . . We have heard a great deal about the tremendous advances in prices, but they have not been made recklessly or carelessly by the dealers. They have only been done after the utmost thought and sincere soul-searching effort. When it comes to reducing prices we may be radical enough, but on an upward market there is an inherent conservatism entrenched in the dealer's bosom which makes him almost a reactionary.

"5. The war problem. This, of course, is the most serious problem in the world to-day, and with the various problems which will come after the war affecting labor and capital, it will continue in our minds without ceasing for many a day. What the outcome of the war will be—when it will close—no man can tell, but it is absolutely true that our attitude toward all of these problems should be one of courage and resolution. That the varied experience of members of the association in different parts of the country can be of great help reciprocally is without question, and I hope we will find time during the meeting to discuss some phases of this problem as it is to-day."

SECRETARY FERNLEY'S REPORT

The report of Secretary-Treasurer Thomas A. Fernley recounted the many subjects which have kept the officers busy during the year, mention of which indicates the scope of the association and the important work it is doing. Some of them follow: Returned goods evil, cash discounts, resale prices, trade commission, overhead cost, methods of distribution, loose leaf supply book, list, prices, cap and set screw situation, credit bureau overstock, advances in prices, and compensation of salesmen. In part Mr. Fernley said:

Coupled with the coming of prosperous times, some of the manufacturers have appeared to feel that they could take up the matter of changing long established terms and that a smaller premium for anticipating the due date of bills could be made effective. The members of this association, selling their goods to thousands of customers, have always found the cash discount of 2 per cent to be a vital factor in assisting them in determining credits, as there are many customers of uncertain financial standing whose treatment was very largely determined by the fact of whether or not such customers availed themselves of the cash discount.

One of our members in writing to the National Association of Credit Men, with respect to the cash discount, says in concluding his letter that he does not look upon the cash discount as compensation for the advanced use of money, but as a trade discount in the nature of a premium for upright dealing and that he would deeply regret the practice being entirely abolished, as he feels that, so long as human nature is one of the elements entering into business relations, premium inducement will be conducive to better harmony and improvement than fret and penalty.

The association has addressed a letter to a large number of manufacturers asking that they maintain the established cash discount of 2 per cent and that in cases where they have considred the withdrawal they give continued thought to the need of the cash discount and determine to continue allowing it to the trade.

S. S. & M. D. A.

Newly elected officers of the Southern Supply and Machinery Dealers' Association.

President, ERNEST HOWELL, Capital City Supply Company, Charleston, W. Va.

First vice-president, GEORGE H. MANNING, Tennessee Mill & Supply Company, Knoxville, Tenn.

Second vice-president, J. B. SIMMONS, Woodard, White & Co., New Orleans, La.

Secretary and treasurer, ALVIN M. SMITH, Smith-Courtney Company, Richmond, Va.

Executive Committee—J. G. BELDING, Lombard Iron Works & Supply Company, Augusta, Ga.; JOHN A. HARVIN, Peden Iron & Steel Company, Houston, Tex.; J. H. HASLAM, Georgia Supply Company, Savannah, Ga.; WILLIAM M. MCDONALD, Fulton Supply Company, Atlanta, Ga.

Chairman of Manufacturers' Conference Committee, MAJOR W. M. BANKS, Banks Supply Company, Huntington, W. Va.

Chairman Textile Committee, F. L. PAGE, Odell Hardware Company, Greensboro, N. C.

SOME THOUGHTS ON PROFIT GETTING

H. G. Mitchell, president Harron, Rickard & McCone, San Francisco, Cal., opened a discussion on the subject of "Profit Getting." In part he said:

I want to call particular attention to the difference between the definition of the terms margin and profit, for in the commercial world a great many people confuse the two. My idea is that the term margin should be used to designate the difference between the invoice cost and selling price, or the amount added by the dealer in the establishment of selling prices, or the amount reserved by the manufacturer in the protection of the dealer; while the term profit should be used only to show what amount we actually make in the operation of our business after the deduction of all expenses. Of course, this term profit could be used in connection with all items such as gross profit, operating profit and net profit after the deduction of all unusual charges or losses applicable to a previous period. But these different terms are much less confusing if the gross profit is referred to as margin or gross gains, the operating profit as operating gains, and then when we refer to profit itself we will understand exactly what it is intended to convey. Strictly speaking, profit indicates the excess of receipts or returns over expenditure or outlay, or the returns from the employment of capital after deducting the amount paid for raw material, for wages, real or estimated rent, interest, insurance, etc.

There are so many elements entering into profit getting that it would be impossible to consider all of them within the short space of time allotted to me. It will therefore be my purpose to simply dwell on these generally with the idea that others will elaborate on the details for our mutual benefit. From our experience in the operation of a business including the sale of machinery and supplies, the manufacturer whose lines we handle, frequently if not always, considers that any margins which we add to our cost represent profit. I believe we have just the same right to expect that same manufacturer, who looks on the entire margin as

profit, to take as his cost in making prices to us the shop record showing the material and labor entering into the manufacture of the article. But does he do so? On the contrary, it is the invariable practice for him to add every definite expense which he finds set against the production of the article and then a margin or percentage to cover overhead, and having thus reached his cost proceeds to add a profit thereto. Every one must admit this is the only business-like method.

The first business session of the Northern dealers was brought to a close with an address by George T. McIntosh, Cleveland, Ohio, on one-cent letter postage. Prior thereto the following Nominating Committee was appointed: George Vonnegut, Vonnegut Hardware Company, Indianapolis, Ind.; W. B. Yost, Stambaugh-Thompson Company, Youngstown, Ohio, and E. C. Ducummun, Ducummun Hardware Company, Los Angeles, Cal. New members admitted at the convention were San Diego Supply Company, San Diego, Cal.; Stanley Belting Company, Chicago; H. P. Weller Supply Company, Erie, Pa., and Cummings, Levis & Levan, Lancaster, Pa.

TWO MAYORS TALK TO DEALERS

At the Thursday morning session of the National Association the regular program was departed from to permit addresses by George Puchta, Queen City Supply Company, Cincinnati, Ohio, mayor of Cincinnati, and Joseph G. Armstrong, mayor of Pittsburgh. A few words were said also by Robert Garland and ex-Governor R. S. Woodruff, of Connecticut. Mr. Puchta advocated the conduct of business on a high plane, intelligent competition, no deriding of competitors' goods, truth telling, even when it might cost an order, and the employment of salesmen inspired with confidence in their house, its goods and themselves.

W. M. Pattison, Pattison Supply Company, Cleveland, Ohio, said what a man put into his business was of quite as much importance as what he got out of it; also that what he put into his business determined the degree to which he had the respect and confidence of his competitors. E. E. Strong advocated the Golden Rule in business.

The question of imposing a charge of 10 per cent where goods are returned was introduced by H. H. Rudd, George Worthington Company, Cleveland, Ohio. In the past year the association has supplied its members with data on the question with a view of minimizing what is admittedly an evil. Mr. Rudd's company has adopted the 10 per cent charge policy, but he said that judgment must be used in its application. It could not become universal, but the plan, with efforts that had been put forth to make both salesmen and buyers more careful, had resulted in the amount of returned goods in 1915 being reduced 20 per cent as compared with the preceding year. If all houses adopted the plan, Mr. Rudd believed it would soon be recognized by all buyers as an acceptable proposition. Discussion brought out that, in some cases where the return of goods was due to mistakes on the part of the shipper, he and not the buyer stood the charge of 10 per cent.

REPORT ON METHODS OF DISTRIBUTION

The Committee on Methods of Distribution, of which C. C. Coventry, Cleveland Tool & Supply Company, Cleveland, Ohio, was chairman, other members being H. C. Ellsworth, White Tool & Supply Company, Cleveland, Ohio, and W. M. Pattison, submitted a report demonstrating the advantages of distributing through dealers. It stated that there is only one middleman in the mill supply business, as against two in many other lines. It was pointed out that the combined annual business of the members of the association amounted to about $150,000,000. Much of their business is with consumers whose orders are not large, and in making even a small sale and delivery one salesman of one house places at the disposal of the customer the product of 15 to 20 different manufacturers at one selling cost and with one delivery expense. The committee concluded:

1. That the supply trade is the natural and necessary outgrowth of the development of the manufacturing and transportation interests throughout the country.

2. That the distributer is the product of modern business conditions, and his existence and continued growth are due to the urgent necessity of these interests for some nearby distributing house that can promptly supply their requirements.

3. That in the conduct of our business, service to the ultimate consumers is a most important factor, and such service can most efficiently and economically be rendered by the distributer.

4. That the distributer can be made a most valuable part of the manufacturer's sales organization. But, in order to develop this co-operation in a mutually satisfactory way, it is proper and necessary that the margin of profit allowed the distributer should be amply sufficient to cover the expense of handling the line with some additional profit added. We sometimes think that there are those manufacturers who forget that, unlike them, we cannot include our selling expense in the costs given our salesmen, and the margin of profit they would allow us is neither sufficient nor attractive, and consequently their line does not receive the attention it otherwise would. The best results can only be secured by placing the line on a profitable basis.

A. S. & M. M. A.

Newly elected officers of the American Supply and Machinery Manufacturers' Association:

President, H. E. DICKERMAN, Chisholm-Moore Mfg. Company, Cleveland, Ohio.

First vice-president, CHARLES W. MILLER, Jeffrey Mfg. Company, Columbus, Ohio.

Second vice-president, GEORGE E. HALL, Boston Woven Hose & Rubber Company, Boston, Mass.

Third vice-president, H. S. DEMAREST, Greene-Tweed Company, New York.

FARNHAM YARDLEY, as an ex-president, becomes a member of the Advisory Board of the association.

WOULD ELIMINATE V THREADS

George Vonnegut, Vonnegut Hardware Company, Indianapolis, Ind., submitted a proposition that in the future all catalogs should indicate that United States standard goods (taps, dies, screw plates, cap and set screws and semi-finished nuts) should be considered as stock, and that V-threaded goods be furnished to order only when specified, and that all members of the association agree not to order for stock any V goods after Jan. 1, 1917.

It was decided that the recommendation in full be printed and sent to all members to ascertain their opinions. The suggestion aroused considerable discussion, particularly on the part of Western members who said that V threads are in general use west of the Rocky Mountains.

E. E. Strong, Strong, Carlisle & Hammond Company, Cleveland, as chairman of the Resolutions Committee, reported resolutions in which the thanks of the association were extended to the general convention committee of Pittsburgh, the city authorities and to the Southern Supply and Machinery Dealers' Association for its attendance.

Among other speakers at the meetings of the National Association were: W. T. Todd, Somers, Fitler & Todd Company, Pittsburgh; R. F. Blair, Pittsburgh Gage & Supply Company, Pittsburgh; N. A. Gladding, E. C. Atkins & Co., Indianapolis, Ind.; J. D. Nicklis, Manning, Maxwell & Moore, Inc., New York; W. E. Frick, Frick & Lindsay Company, Pittsburgh; W. B. Yost, Stambaugh-Thompson Company, Youngstown, Ohio; E. B. Hunn, Mersick & Co., New Haven, Conn., and E. H. Miller, president National Retail Hardware Mutual Fire Insurance Company.

An interesting statement made at the meeting, compiled from reports received from members, set forth that the general average of selling expense in the past five years was 15.90 per cent.

Southern Dealers Meet

The meetings of the Southern Machinery and Supply Association were well attended, as usual. They were executive, and presided over by the retiring president, J. G. Belding, Lombard Iron Works & Supply Company, Augusta, Ga.

The report of Secretary-Treasurer Smith, among other things, said:

Our relations with the manufacturers are, considering the abnormal conditions existing, in the main satisfactory, though I am constantly hearing that manufacturers are holding up orders placed at low prices and are shipping out later ones placed at higher prices, but in no case has any proof been furnished to substantiate such complaints. I have also received complaints stating that manufacturers would ship small orders of new business at prevailing market prices while claiming to be unable to ship any portion of stock orders for large quantities of similar material. We have received complaints and run down quite a few against manufacturers for circularizing and soliciting consuming and retail trade while at the same time soliciting and fostering the jobbers' business. In most cases we have succeeded in showing such manufacturers the error of their way.

The manufacturers of course have had a great deal to contend with during the past 12 months, but just as long as they solicit and express a desire to use us as their distributers they should co-operate with us to the fullest possible extent, and we in turn should be most particular in doing the same thing. Without the manufacturer we, of course, can not exist, and on the other hand I am quite positive they need us, for we are essentially a part of their selling organization and can market their goods for them to much greater advantage than they can direct. Mutual confidence and goodwill toward each other will go a long way toward keeping our relations with each other profitable and pleasant.

A most important matter in connection with our relations with manufacturers is the constant and frequent change on their part of list prices. This trouble is getting worse all the time instead of better, and while it is undoubtedly costing the manufacturers some money, it is costing the jobbers much more.

Points brought out in the discussions were that profits should be commensurate with the present cost of doing business; that jobbers should benefit to the fullest extent from contracts which are in force; that all cities should have local associations; that jobbers should not cut prices; that consumers' purchasing agents (where several consumers club together) are inimical to the interests of jobbers; that there should be insistence on the allowance of cash discounts, but that customers must live up to them; in no case should a greater discount be allowed than is given to the jobber by the manufacturer, and that resale prices should be upheld.

Entertained on Lavish Scale

It would be unfair not to mention in some detail what was done to entertain the visitors outside of their business sessions and the ladies at all times. Wednesday evening there was a formal reception and ball at the William Penn Hotel. On Thursday afternoon the ladies were taken in automobiles for an inspection of the H. J. Heinz Company's plant, and in the evening there was a vaudeville dinner in the ballroom of the William Penn. On Friday afternoon the ladies were taken in automobiles to the Country Club, where they were entertained with luncheon and cards. In the evening came the last function, a stirrup-cup supper-dance. The grand march on Wednesday evening was led by Col. H. P. Bope, of the Carnegie Steel Company, and his daughter. Ostrich feather fans were presented to the ladies at the ball, and a cut glass goblet was presented to each guest at the vaudeville dinner, which was the largest social event ever held in Pittsburgh. At no time was there any confusion, the crowd of 800 men and 200 women being handled without a hitch. The convention badge admitted the wearer to all affairs.

On Friday afternoon a party of about 300 was taken by steamer up the Monongahela River, and visits were made to the National works of the National Tube Company at McKeesport and the Duquesne plant of the Carnegie Steel Company. At both plants the guests were shown as much as the time permitted. On every side were heard complimentary allusions to the work of the various convention committees.

The only producer of zinc in New York State in 1915 was the Northern Ore Company. Its zinc properties in St. Lawrence County were actively developed and a 200-ton mill was in successful operation in the latter part of the year. It is probable that at least one other company will operate in 1916.

Cost of Pig Iron in California

A general outline of the iron-ore deposits of California was given by Charles C. Jones in a paper, "The Iron Ores of California and Possibilities of Smelting," before the American Institute of Mining Engineers. The following table was presented, comparing the cost of iron ore at Pittsburgh and Los Angeles. In the column representing California ores, the author states, a maximum haul of 260 miles is assumed, at 0.5c. per mile.

	Pittsburgh, Lake Ores	Los Angeles, California Ores
Rail and lake rate to lower lake ports	$1.15	...
Rail freight rate, lower lake ports to furnace location	0.88	...
Rail freight rate, Eagle Mountains, Providence Mountains, and San Bernardino County ores	...	$1.30
Total transportation costs per ton	2.03	1.30
Average mining cost per ton	2.40	0.85
Total transportation and mining cost per ton	4.43	2.15
	Per Cent	Per Cent
Iron yield per ton ore, non-Bessemer grade	51.5	57.00
Iron yield per ton ore, Bessemer grade	55.0	64.00
Total transportation and mining cost per ton pig iron, 95 units iron, non-Bessemer grade	$8.17	$3.56
Total transportation and mining cost per ton pig iron, Bessemer grade	8.05	3.19

Mr. Jones's figure for the "average mining cost" of Lake Superior ore is much too high, so that his "comparison" between Pittsburgh and Los Angeles is not valuable.

Assuming other costs than the ore, coke and flux to be the same at Los Angeles as at Pittsburgh, the author gives the following as an estimate of the cost of a ton of pig iron at Los Angeles:

Estimated Cost of Pig Iron at Los Angeles

Total transportation and mining cost per ton pig iron, Bessemer grade ore	$3.19
Total cost of coke per ton pig iron	8.02
Limestone	0.49
Scrap, cinder and scale	0.27
Labor and maintenance at furnaces	1.37
Depreciation of furnaces	0.40
	$13.74

The figures for all items apart from ore, coke and limestone are taken from Judge Gary's testimony before the Ways and Means Committee at Washington in 1906, concerning average costs at Steel Corporation furnaces.

Carbon Dioxide Flue-Gas Recorders

"Instruments for Recording Carbon Dioxide in Flue Gases" are described in Bulletin 91 of the Bureau of Mines, by J. F. Backley and S. B. Flagg. It states that because of the large number of steampower plants operated by the Government and the number of carbon dioxide recorders used therein, the Bureau of Mines undertook to collect information regarding the practical application of such recorders. Articles published concerning such recorders have been mostly descriptive, giving little reliable information as to the results to be expected from the various types of instruments in ordinary practice, and most tests have been of a laboratory nature. The Bureau's tests of different types are made under service and laboratory conditions, and the results, as here published, show the factors affecting the accuracy of such recorders and how they should be used.

In order to make it possible, in making aluminothermic mixtures in the thermit process, to add more than 20 per cent of additional constituents, without lowering the temperature of the reaction too much and thus reduce the cost, 15 to 20 per cent being the customary proportion, a method has been patented by John H. Deppeler of Jersey City, N. J., and assigned to the Goldschmidt Thermit Company (U. S. 1,168,061—Jan. 11, 1916). The additional constituents are placed in a separate container (which will melt when heated to welding temperature) and preheated by the waste gases from the torch used in heating up the sections to be welded. This container, when preheated to a red heat, is then placed in the aluminothermic mixture in the reaction crucible and melts together with that mixture in the mold in which the welding operation is carried on.

AGAINST TAVENNER BILL

Sentiment Grows, Postmaster General Aiding—To Be Made a Rider

WASHINGTON, D. C., May 16, 1916.—The program of the promoters of the Tavenner bill prohibiting scientific shop management in Government establishments to place this vicious legislation on the statute books has just been disclosed by the action of Senator Hughes, of New Jersey, a prominent member of the Senate Committee on Education and Labor. He has given notice that he will offer an amendment to the Postoffice appropriation bill providing that "hereafter no official, superintendent, foreman or other person having charge of the work of any employee in the postal service shall be permitted to make or cause to be made with a stopwatch or other time-measuring device or system, a time study of the movements of any such employee." The Postoffice appropriation bill passed the House before the Tavenner bill had been considered by the House Labor Committee; hence no opportunity was afforded to amend the appropriation bill by attaching the Tavenner measure as a rider. The appropriation bill is now in the Senate committee, to which Senator Hughes's amendment has been referred, and its author will therefore have two opportunities of urging its adoption, first in committee and later when the bill is taken up on the floor. The suggestion has been made that the amendment may be defeated if offered on the floor, by the point of order that it is new legislation, which, under the rules of the Senate, can be added to an appropriation bill only by unanimous consent. It is to be regretted that the parliamentary precedents are against this suggestion, it having been repeatedly held that amendments which merely restrict the manner in which an appropriation may be spent are not new legislation.

More encouragement that the Hughes amendment may be beaten is to be found, however, in the report, apparently made on authority, that Postmaster-General Burleson is personally strongly in favor of the adoption of scientific management systems throughout the postal service and will appear before the Senate Postoffice committee to protest against any legislation that may hamper the department in carrying out certain reforms instituted during the past year and which are understood to be the basis of the complaints of a few employees, which have been taken up by Representative Van Dyke, himself a former postoffice employee and now a member of the House Labor committee. Mr. Burleson is said to be very much in earnest in his intention not to take a backward step in the campaign that has been begun to install up-to-date business methods throughout the postal service and the outcome will be awaited with much interest.

SENTIMENT GROWS AGAINST THE BILL

Sentiment in Congress against the Tavenner bill is growing steadily under the influence of the campaign of the Committee of Ten appointed by the engineering societies to oppose this measure. While it is probable that the Labor committee will afford no opportunity for the reconsideration of the vote by which the Tavenner bill was ordered to be favorably reported, yet it is now a certainty that a strong minority report will be presented and utilized by a number of members of the House in opposing the new program of the friends of the Tavenner bill.

As foreshadowed by the action of Senator Hughes, this project involves the abandonment of the Tavenner bill as an independent measure and its incorporation as an amendment to as many of the annual appropriation bills as possible. The bills immediately in view are the fortifications, army, navy and sundry civil, the last mentioned carrying numerous lump sums to cover the cost of work done by the various civil departments of the Government, either by contract or on the basis of days' wages. The first of these measures to be taken up will be the fortifications bill, which carries the bulk of the appropriations expended at the Watertown Arsenal. This bill will probably come before the House in about two weeks, when it is understood to be Representative Tavenner's intention to offer his amendment as a rider. For some reason, which has never been made clear, the labor leaders overlooked this bill in the last Congress when the so-called Deitrick amendment, identical with the Tavenner bill, was added to both the army and navy appropriation bills. The sundry civil bill will probably come next and be followed in order by the army and navy appropriation measures.

Representative Keating, of Colorado, who is now engaged in drafting the majority report of the Labor committee on the Tavenner bill, appears to be in no haste to complete his labors, but it is understood that he will present the report in the House before the fortifications bill is taken up. In the meantime the minority report is rapidly nearing completion and whatever the outcome of the battle now in prospect, it is certain that the opponents of shop management will not be permitted to win by default.

Resolutions adopted by the National Chamber of Commerce against the Tavenner bill have been forwarded to members of the Senate and House and are being followed up by protests from many of the organizations affiliated with the National Chamber. It is understood that Secretary of War Baker, who is already on record in a vigorous letter against the Tavenner bill, is collecting information of importance for transmission to Congress. W. L. C.

British Columbia to Aid Shipbuilders

Provision for aid to the aggregate amount of $2,000,000 to the shipping and shipbuilding industry of the province is contained in a bill which Premier Bowser has introduced in the British Columbia Legislature. The bill proposes the creation of a commission, which will have control of the administration of the act. Loans will be made to the amount of 55 per cent of the value of the ships built under the supervision of the commission. These loans will be paid to the owner of each ship up to the number of not more than twenty ships, constructed after the coming into effect of the act, in ten annual instalments, each instalment being computed as to bring the net earnings of the ship up to 15 per cent of the actual cost. The subsidy paid in any one year shall not amount to more than $5 per ton dead-weight capacity, the first annual payment to be made in the first year after peace is declared and thereafter annually.

It is stipulated that this subsidy shall be paid only as long as the ship remains in continuous British Columbia service; that is, carries cargoes from British Columbia and brings return cargoes to the province. Provision is also made for aid to shipbuilding plants to the extent that the commission, subject to the approval of the Lieutenant-Governor-in-Council, may advance in securities to the amount of 55 per cent of the actual cost of such plant, as certified by the commission, and after the commission has assured itself that the company can furnish ample security to protect the government. The security to be issued to the above amount will be guaranteed by the government as to principal and interest not exceeding 6 per cent. It is further provided that, in the event of the Dominion Government giving a subsidy to any ship claiming subsidy from the provincial government, the federal subsidy shall be deducted from the subsidy payable by the province and only the deficit after such deduction shall be payable by the province.

Bonus System at Tata Steel Works

Members of the British Steel Smelters Society employed by the Tata Iron & Steel Company, Ltd., at Sakchi, India, are reported to be receiving a bonus on the output. The first hands get 1½d. (3c.) per ton and the second hands 1d. (2c.) per ton for all output over 8000 up to 9000 tons, and for all output over 9000 tons the first hands get a bonus of 2d. (4c.) per ton and the second hands 1½d. (3c.) per ton. The bonus is paid on the month's production, which in November was 11,600 tons. This would give £27 18s. 4d. ($135.85) to be divided for the month among the first hands and £20 8s. 4d. ($99.39) among the second hands.

EFFICIENCY OF TOOL STEELS*

Relations Between Cutting Capacity and Brinell or Scleroscope Hardness

BY J. O. ARNOLD

In papers recently read before the Iron and Steel Institute there has been a tendency to regard the Brinell and scleroscope numbers registered by hardened steels as an approximate measurement of their cutting efficiencies in the lathe. Indeed, it has been suggested that, instead of ascertaining the efficiency of high-speed steels directly in the lathe, the Brinell test might be substituted for the costly and prolonged proceeding of making systematic lathe tests.

The purpose of this brief communication is to show that not only is there no relation between Brinell hardness and lathe efficiency, but also that a plain carbon turning tool with very high Brinell hardness may, on comparison with another tool of considerably lower Brinell hardness, register an efficiency of practically zero, while the tool of about 15 per cent lower Brinell hardness may run perfectly for 18 minutes, and during the last 5 minutes of the test cut cleanly at a blood-red heat before breaking down.

The Brinell hardness of a properly hardened tool is an almost negligible factor of efficiency. The efficiency depends almost entirely on the thermal stability of the simple or compound hardenites in the hardened steel. The simple hardenite of plain carbon steel has a thermal stability of which the limit is certainly less than 300 deg. C., while the compound hardenite of a carbon-tungsten-chromium-vanadium high-speed steel, also secured by water quenching, may be rendered stable up to a temperature of about 700 deg. C. The proof of the foregoing enunciation is embodied in the table.

If tested, other things being equal, with the steels in the table, a hardened best crucible-cast plain carbon steel, containing about 1.25 per cent combined carbon, would endure for perhaps two seconds. Therefore its endurance would be roughly 0.3 per cent that of the tungsten-chromium steels and about 0.2 per cent that of the tungsten-chromium-vanadium steels. Nevertheless its Brinell hardness would be about 700 as against the 600 numeral registered by the high-speed steels.

Again, according to the mean Brinell test (602), the tungsten-chromium steels should average an efficiency of 0.3 per cent greater than the constant numeral (600) of the tungsten-chromium-vanadium steels, yet the actual efficiency of the latter is 63 per cent greater than that of the former. In a word, the Brinell and scleroscope tests, while valuable means of rapidly determining the approximate elasticity of structural steels, are valueless, or indeed worse than valueless, for estimating the varying thermal stabilities of the hardenites which mainly determine lathe efficiency.

The author and Dr. A. A. Read have shown (Proceedings of the Institution of Mechanical Engineers, November, 1915, p. 645) that there are four single hardenites on solid saturated solutions of carbides: Iron hardenite ($Fe_{21}Fe_3C$), vanadium hardenite ($Fe_{77}V_4C_3$), tungsten hardenite ($Fe_{36}WC$), and ferro-molybdenum hardenite ($Fe_{24}Fe_3Mo_3C$). The double, triple and possibly quadruple hardenites of high-speed steels yet remain to be discovered, but owing to a grant-in-aid of £200 from Sir Robert Hadfield, the author, and Prof. A. A. Read of the University of Wales, are now proceeding with this complex research.

Table of Efficiency and Hardness of Certain Types of Steel

University Steel No.	Type of Steel, Compositions nearly Identical for Each Type	Duration of Tests in Minutes and Seconds Before Breaking Down: 1st Grind M.	S.	2d Grind M.	S.	3d Grind M.	S.	Mean M.	S.	Efficiency, Cu. In. of Standard Hard Steel Shaft Removed: 1st Grind	2d Grind[1]	3d Grind	Mean	Brinell Hardness No. Pressure, 3000 Kilos; Ball, 10 Mm. Diameter	Scleroscope Hardness No. Av. of Four Tests
1523	Tungsten-chromium	10	7	11	45	9	26	10	26	47.4	56.3	43.3	49.0	600	82.8
1527	Tungsten-chromium	11	25	12	35	10	32	11	32	54.7	61.4	49.4	55.2	629[2]	80.5
1533	Tungsten-chromium	10	26	11	50	11	31	11	18	48.9	56.7	55.0	53.5	578	80.3
1522	Tungsten-chromium-vanadium	14	17	17	59	13	40	15	19[3]	72.3	96.2	68.0	78.9	600	80.3
1524	Tungsten-chromium-vanadium	17	2	17	49	16	57	17	24[3]	91.0	95.2	89.1	91.8	600	75.5
1528	Tungsten-chromium-vanadium	16	2	17	52	16	57	17	24[3]	84.1	95.7	89.1	89.6	600	76.3
1534	Tungsten-chromium-vanadium	15	21	17	10	15	45	16	27[3]	79.0	91.6	81.1	83.9	600	81.0

NOTE.—The Brinell and scleroscope hardnesses were taken as near as possible to the hardened cutting edges of the various tools.

[1]It will be seen that with both types of steel the maximum efficiency is obtained on the second grindings of all seven tools.

[2]Duplicate test 629.

[3]Throughout these tests the cutting edge of the tool was red-hot at the breakdown points, and indeed for about five minutes previous to breaking down.

*From a paper read at the meeting of the Iron and Steel Institute, London, May 4, 1916. The author is professor of metallurgy, University of Sheffield.

Book Review

The Corrosion of Iron. By L. C. Wilson. Pages vi + 178, 5 x 7½ in. Published by the Engineering Magazine Company, New York. Price, $2.

This volume is a compilation of information on the corrosion of iron and steel. It goes carefully into the three principal theories of corrosion—the hydrogen peroxide, the carbonic acid gas and the electrolytic. Very properly the author emphasizes the prevention of corrosion, the practical side of the subject with which the trade is more generally interested. Of the methods of protection, the coating of the iron or steel either by oxide or by other metals is of course a process of manufacture, and is rather briefly described, while the other way, covering it with a paint, is carefully analyzed and the paint ingredients, oils, dryers and pigments, with their influence on durability, are discussed at considerable length. A vital chapter is that devoted to the proper preparation and application of the paint film. Pipe corrosion data and controversies are detailed. The effect of different elements, especially with regard to their influence on electrolysis, is taken up and D. M. Buck's earlier work along this line is given. The author places much hope in the use of copper-bearing steel as a rust resister.

A paper on oil fuel was presented to the International Engineering Congress, San Francisco, September, 1915, by Ernest H. Peabody, engineer of the marine department of the Babcock & Wilcox Company, New York City. This paper, together with the brief discussion, has been reprinted for general distribution and constitutes a pamphlet of 134 pages generously illustrated and provided with a number of folding inserts of a statistical as well as engineering nature. It is probable that a copy of the paper may be obtained on request.

The records of the Bridge Builders & Structural Society, as collected by its secretary, George E. Gifford, show that during the month of April, 1916, 72⅓ per cent of the entire capacity of the bridge and structural shops of the country was contracted for.

Conference on Scientific Management

Three Days' Meeting at Ann Arbor, Mich., Conducted by the Taylor Society—Emphasis on Types of Industry as Regards Management

A CONFERENCE on scientific management was held at the University of Michigan, Ann Arbor, Mich., May 11, 12 and 13. The attendance was large, borrowing from that part of the university student body pursuing management studies, but the registration of out-of-town participants was nearly 200. With this indication of interest, taken in the light of the caliber of men joining in the meeting, a marked growth is clearly shown in the modern industrial management movement since the conference of October, 1911, at the Amos Tuck School of Administration and Finance, Dartmouth College. The outstanding feature of the meeting was the emphasis on the fact that while the principles of scientific management are of universal application, they must be applied with different relative emphasis and with varying mechanism in various types of industry. The labor side of the problem, according to those in charge, was purposely given no special consideration on the program; and at the final session the claim was made that scientific management practitioners had approached the problem too much, perhaps, from the engineer's point of view and were not keeping in mind to the extent they should the phychological, physiological, sociological and political economy phases of the subject. Withal the discussions kept close to what is sometimes termed the practical but, as many agreed, opened avenues of thought which were new to them.

The conference was held by the Taylor Society, formerly the Society to Promote the Science of Management, and, by the courtesy of the University of Michigan, took place in the Engineering Building of the university. It was planned as a successor to the Dartmouth conference. It was opened Thursday, May 11, and the chief event was an address by Henry P. Kendall, treasurer Plimpton Press, Norwood, Mass. This was uniformly estimated as standing alone as a masterly presentation of the principles and problems of the science and art of management. Friday morning was given over to a number of simultaneous section meetings in recognition of the fact that industries fall into types for purposes of management, not according to similarity of raw materials or product, but according to the nature of the processes, specifications and machinery. These round-table talks were introduced by an address by Sanford E. Thompson, consulting engineer, Boston, and a member of the Committee of Ten working to oppose legislation antagonistic to efficiency in industry. Friday afternoon was devoted to an illustrated address by Charles Day, Day & Zimmermann, Philadelphia, on scientific management in the operation of a public service corporation and to a continuation of a discussion on sales management carried over from the morning's sectional meeting. The evening was spent in the reading of an address, entitled "An Illustrated Trip Through Scientifically Managed Factories," prepared by H. K. Hathaway, vice-president Tabor Mfg. Company, Philadelphia, and presented by G. E. Schultz, of that company. Saturday morning was reserved for a review of the conference through addresses covering observations made by the different speakers. Not only did this session contribute to the tangible benefits of the conference as a whole, but it provided the dramatic incidents which prevented the conference's passing without some flashes of comedy and stirring argument.

THE HUMAN ELEMENT IN MANAGEMENT

It was at the last session that some consideration was paid to the human element in management. Dr. Harlow S. Person, president of the society, presided. The conference at Dartmouth five years ago had shown, he said, that the discussion then on this subject was based on total ignorance; and the matter of the relationship between management and labor was omitted at this meeting because even yet there is a lack of knowledge of what the principles of management really are and accurate information is not as yet general enough. "Our duty," continued Dr. Person, "is to make this information still more general before it is wise to undertake to discuss it at length." Labor leaders are concerned not so much on the form of the management so long as this form is one which lends to the promotion of group interests. Scientific management starts from the point of view of the individual owner and the individual man.

Incidentally he mentioned how in the course of a convention of employing managers, one participant expressed it as his judgment that the three best cases of regularization of employees, as indicating satisfactory relations between employer and employee, were those of the Clothcraft Shops in Cleveland, the German-American Button Company, Rochester, N. Y., and the H. H. Franklin Mfg. Company, Syracuse, N. Y., and the speaker, Dr. Person emphasized, did not know that all three of the plants mentioned were operating under the Taylor system of management.

H. P. Kendall, the first general speaker of the review session, said the pay question should be subordinated, that too much emphasis is commonly given to the method of pay because the employer has not appreciated the preparatory work necessary to get an industry working under the Taylor system. In his own case, it took two years to get the stores in proper shape before routing, for example, could be planned for, let alone working out the bonus method of payment. While paying his compliments to the leaders of labor, and in particular regarding their doubtful sincerity, in his own experience he had found it wiser to work with the union than against it and had succeeded in having the real leading men of the union in his own employ, thus securing the best men for his own work and having men who thus hold office in the union.

Each union he regards as an opportunist. In its fundamental philosophy the union, he urged, knows well that scientifically managed plants are not sweat shops, although they argue to the contrary; but they see in scientific management a better tool in the hands of the employer and they are afraid of it.

As showing something of the universal character of scientific management, he mentioned an experience in connection with some three industries with which he is actively connected. No two of these are alike in product or the manufacturing problem, but he proved that it was possible to take a man in one plant and another from another plant and place them in a third plant for corresponding functions of work. In short, under the functionalizing of duties under scientific management, he had been able to mobilize, as he expressed it, seven men for the development of the stores system, the routing and the accounting in a factory in which none of the seven had worked before and with which they were not acquainted.

Boyd Fisher felt that scientific management had not yet given sufficient attention to the matter of local economics or to general economics as influencing the conditions in the entire community in which the factory may be located. It belonged to the Taylor Society, he believed, to confer on the matter of supervising employment. There are many things that plants can do only by united action, he argued, and he drew from the experiences of the Executives' Club of the Detroit Chamber of Commerce, of which club he is vice-president. He did not believe that any one plant can set a wage rate, not even a Ford Motor Company. Nor has anyone sufficient resources to make adequate investigation of the cost of living and its relation to the setting

of rates. He paid a tribute to George De A. Babcock, production manager for the Franklin Automobile Company, as the first one to study the problem of the base rate in some detail. A number of manufacturers, he said, can go a long way toward establishing such a rate.

INEFFICIENCY BUREAU AND ITS OBJECT

Referring again to the Detroit Chamber of Commerce, he mentioned its proposition to establish an Inefficiency Bureau. With the extension of physical examinations of employees and applicants for employment, there are an increasing number of men being rejected on account of defective eyesight and other physical weaknesses. These rejections, he said, are commonly not explained by the management, largely owing to fear of the union, but instead the men are turned on the community, although they sometimes have relievable defects. He told how he took a number of men who did not get by the employment bureau, on account of eyesight, and taking them to oculists and having them provided with glasses they were afterward admitted into the very plants where they had been rejected. Moreover in plants not conducted under anything approaching scientific management, men are often discharged as faulty when they are not sufficiently tried out. The object of the inefficiency bureau is to prevent physical misfits from being a charge on the community. Oftentimes a man with one leg has unusually good arm development and in some cases, factories have found positions for the deaf and dumb.

As relating to the effect on general economics of independent action on the part of a given industrial establishment, say in raising wages, he described a conspicuous case in which the advance immediately raised rents and soon resulted in higher living costs and less return to those affected than before the event.

Prof. E. D. Jones of the department of economics of the University of Michigan, took a similar stand to Mr. Fisher's. He felt that a limitation of the Taylor principles of scientific management as at present practised is that it focuses so specifically on the mechanism of management that the manager is inclined to regard his problems too closely in a mathematical sense. He holds that it would be advisable for the society to affiliate with other associations, such as those having to do with psychology, physiology (at least so far as relates to fatigue questions), sociology and economics. The other associations need the advantage of the work of the Taylor Society and the public, he added, also is in need of such co-operation. The public, he claims, sees too much of the technique of management but feels that the human factor is not properly heeded.

Richard A. Feiss, general manager Clothcraft Shops, Cleveland, took the stand that the human problem is especially aimed at by the Taylor system. For example, rejections of workmen rarely happen in a plant under scientific management, because such management puts the man at his proper job. He emphasized the human element as the important thing in scientific management and that if such management adds nothing to the man, it would have been dropped long before this. The workman under such management knows that he is being served by the management, and physiology and psychology are constantly observed. He called attention to the freedom of strikes in plants under modern management.

Carl G. Barth asserted that scientific management makes many a man a better man by the mere speeding up of his machine and giving him conditions which allow him to develop his best. Such a system also is working for the good of the National Government in making better citizens. He said that many of those with these so-called advanced ideas are following a mental dissipation, and the term mental dissipation was applied by Mr. Taylor himself to such arguments.

PUTTING SHOP AND OFFICE ON SAME LEVEL

Henry G. Noyes, in closing the discussion, mentioned how with his company, the German-American Button Company, the effort is to eliminate anything that looks like privilege in industry. In industrial plants where the office end has become large, as is particularly the case in scientific management, the same hours of labor should, he held, be provided as for the works proper. All his employees are allowed to have the equivalent of two weeks' vacation with pay as has been the practice in the office portion.

Another indication of the breaking down of the privilege generally regarded as belonging to the office is a practice to pay all employees in envelopes; where there is no smoking in the factory, none is allowed in the offices.

Some fourteen years ago his company established department meetings conducted on company time. While in the beginning many of the men were skeptical about the value of the meetings and were slow to make suggestions because they felt that they would "get in wrong," now they have come to understand the attitude of the company and frank expressions are the rule. In these meetings care is always taken in respect to the use of certain words; for example, certain individuals are ascribed as having responsibility rather than having authority.

TYPES OF MANAGEMENT

What Sanford E. Thompson had to say in his paper preceding the various sectional meetings was in part as follows:

The fundamental principles of the science of management frequently are confused with the machinery necessary for carrying the principles into effect. But we must bear in mind one thing—to accomplish great things, great efforts are necessary. If scientific management would come in with the summer breezes, it would have been adopted universally long ago.

In manufacturing, if we separate work into different types, we are apt to classify them on a basis of the product. The broader plan—the plan in accord with modern principles of management—is to consider in the same type those in which the fundamental principles of treatment are alike.

Considered from the point of view of method of attack and manner of treatment, industrial plants may be considered in three groups in which variously predominate:

1. Scientific research, required for a plant where the production is handled as a whole by a continuous flow, as in a paper mill or in a pulp mill, or a cement mill, and the principal study must be devoted to standardization of methods and improvement in quality.

2. Planning and routing, required as the first essential where, as in a printing shop or a shop manufacturing miscellaneous but standard products with independent machines, also involving much detail because of small orders or numerous parts.

3. Analysis and detail instruction, required as the chief essential along with the complex planning and routing, such as in a machine shop.

In the processes of type 2, the attainment of maximum success requires that the various parts of products get to the right machine and to the right man in such a way as to avoid idle time either of the machine or of the operative.

Type 3, which comprises machine shops, is similar to type 2, except with more complicated machinery; complicated in the sense that the operations upon each machine are more varied and the standardization of the machine itself is, therefore, more complicated. Standardizing of the machines for the various products is necessary; thorough analysis is essential. Yet here again the other characteristics, standard materials, standard methods, planning and routing (in fact, routing in the machine shop produces one of the greatest pick-ups) and time study are all necessary.

THE MACHINE SHOP SECTION

The machine shop section was led by Carl G. Barth, who explained, by way of anecdotes, a number of the details of introducing scientific management in such shops. He dwelt particularly on the work done at the Pullman Company's works. These incidents related in part to the speeding up of the shafting from 125 to 250 r.p.m., much to the consternation of the mechanics who were sure that the building would be rocked to pieces. The ordinary mechanic, he observed, knows so many things that are not so, and is an obstacle which has to be overcome in making what seem to be radical changes. He told of this same difficulty in getting proper drilling speeds and showed how some old $200 machines inadequate for the purpose had been strengthened at a cost of $285, so that they did the work just as well as new $700 machines suitable for the work.

His talk dwelt largely on the scheme of organization, with particular explanation of the functions of the planning department and of the work of the functional foreman as distinguished from foremen of the old school, as those supervising work on certain machines, for example. In other words, instead of a foreman in charge of lathes, a foreman in charge of the drilling machines, a foreman in charge of milling machines and one having charge of the assembling, there are functional foremen of transportation, to see that materials are moved all about the works, let alone in the machine sections mentioned; the gang boss who must see that a man has a job ready for him following that on which he is at work and thus checking the planning department; the feed or speed boss, though he would prefer the former title, as the man supervising working speeds; the inspector and the repair boss, who not only needs to see that machines are kept in repair but are not abused. He emphasized that every operation in manufacture requires inspection until it is shown that it does not need it, and that modern inspection works to make good those parts that are not up to par and might otherwise be thrown away. He also discussed at length the classification of materials and parts in storage.

MANAGEMENT OF SALESMEN

In the sectional meeting on the sales problems, Henry Noyes and John M. Bruce, consulting engineer, New York, took part. Mr. Noyes told how his salesmen sent in cards of a preliminary nature from which are made up what the company calls a diagnosis sheet. This gives the company some idea of the amount of business done by each of its customers, what percentage it gets itself, why it does not get more and generally gives material for the sales committee of the company to work up a definite campaign in addition to the general sales policy.

He also described something of the training given to the salesman in the factory itself before he is sent out from the home office, so that men are obtained who can talk with some experience and engender the confidence which is important. Beginning June 1 salesmen are expected to hand in a daily report, but a form of card has been developed which will demand a minimum amount of time on the part of the salesman. He needs, for example, merely to put a circle around the number corresponding to the day of the month, a circle around the number which corresponds to the number of calls he has made and a circle around the number corresponding to the number of orders which he has taken.

Mr. Bruce described chiefly work done with salesmen who are used to exploit an article naturally distributed by the jobber. His point is that the jobber's representative is merely an efficient order taker and the jobber would have no existence if he attempted to exploit some of the 4000 items, say, which he carries. He described briefly a point system used for rating and rewarding salesmen sent out by the manufacturer. If some of the goods are those which practically sell themselves, his special problem is to insure the movement of those articles which require salesmanship and display by the local distributor. Under his system more points are given to the man who succeeds in the introduction of the slower selling articles and he gets credit for calls even where no sales are made on the score that this is demonstration or advertising. Every report is given some credit and generally speaking the system inculcates a habit of industry that is obtained in no other way, particularly as it is a patent fact that the average sales force suffers from time wasted rather than from time profitably spent.

A bonus is paid on the establishment of a certain number of points as a task, but a salesman getting a higher base salary than another has a higher task or number of points to meet than one with a lower salary. The work of the salesmen is also subject to inspection by someone whose duty it is to visit the men at work, say twelve times a year, and the quality is measured with a certain number of items which are checked to determine the quality in a quantitative way and eliminate the personal equation on the part of the inspector. If the standard of quality, for example, on the case of the visit passes below 75 per cent, the salesman loses the bonus for the period covered by the single inspection test. It happens that there are so many items covered by the specifications for quality, that it is a rare case that a man loses all of his bonus through the quality factor. In the year or two over which the system has been employed, there have been few discharges on account of attempts to cheat the system.

Mr. Bruce also told briefly of a method now in development for selecting men of suitable qualifications for time-study work. He indicated briefly that the examination covers quickness and accuracy in perfection, a measure for tact and one for ingenuity. He indicated that the test had shown up satisfactorily in its comparison with the judgment of six different superintendents of a company which had come to the conclusion that eight of its time-study men were satisfactory but nine would have to be put to other work. The test developed jointly by Mr. Bruce and Prof. Walter Dill Scott in an independent examination of this group of seventeen together with some new men showed the eight men satisfactory to the superintendents were also the ones which passed the test while the other nine ranked below them. The judgment of the superintendents, however, was that the man who had been given the No. 1 was placed as No. 4 by the test.

THE INTERIM SESSIONS

The foregoing brief report would not be complete without some reference to the succcessful efforts to make the stay of the visitors as pleasant as they were profitable. A smoker, a reception and luncheons at the Michigan Union added to the social features, and the holding of the meeting within the confines of the University of Michigan campus gave an atmosphere of delightfulness not easily secured in usual meeting places. The visitors are greatly indebted for their good times to Prof. Joseph A. Bursley of the Michigan faculty, who, in his work in the Engineering School, is incidentally conducting a course on scientific management.

PART LIST OF ATTENDANCE

George D. Babcock, production manager, H. H. Franklin Mfg. Company, Syracuse, N. Y.

A. L. Baldwin, chief engineer, Detroit Steel Products Company, Detroit.

Carl G. Barth, Carl G. Barth & Son, consulting engineers, Philadelphia.

Emile J. Boyle, production manager, Aluminum Castings Company, Detroit.

C. E. Bement, secretary and general manager Novo Engine Company, Lansing, Mich.

H. G. Benedict, factory manager, Madison Motors Company, Anderson, Ind.

Dr. Ernest S. Bradford, special agent, Federal Trade Commission, Washington, D. C.

D. C. Briggs, manufacturing superintendent, Detroit Steel Products Company.

George M. Brill, consulting engineer, New York and Berkeley, Cal.

John M. Bruce, consulting engineer, New York.

Robert W. Bush, Ford Motor Company, Detroit.

Joseph A. Bursley, professor of mechanical engineering, University of Michigan, Ann Arbor.

S. D. Chapin, Barcalo Mfg. Company, Buffalo.

F. L. Clark, assistant physicist, Bureau of Standards, Washington, D. C.

Henry T. Cope, treasurer Trio Mfg. Company, Detroit.

W. E. Crispin, manufacturing department, Ford Motor Company.

W. A. Davidson, engineer, Singer Mfg. Company, South Bend, Ind.

Charles Day, Day & Zimmermann, Philadelphia.

H. B. Downe, Barcalo Mfg. Company, Buffalo.

Clyde J. Drake, management engineer, 72 West Adams Street, Chicago.

C. W. Drake, industrial engineer, Westinghouse Electric & Mfg. Company, Chicago.

Dr. Horace B. Drury, Ohio State University, Columbus.

Frederick A. Eckert, superintendent, Northern Engineering Works, Detroit.

D. F. Edwards, comptroller Olds Motor Works, Lansing, Mich.

Frank B. Eilers, manager, Standard Chemical Works, Kalamazoo, Mich.

Boyd Fisher, vice-president Executives Club, Detroit Board of Commerce.

John J. Foot, assistant vice-president McClary Mfg. Company, London, Ont.

Charles T. Gilbert, superintendent, Saginaw Mfg. Company, Saginaw, Mich.

Frank B. Gilbreth, consulting engineer, Providence, R. I.

Bryant B. Glenny, Ja., Barcalo Mfg. Company, Buffalo.

Harold B. Gould, Joseph T. Ryerson & Son, Chicago.

K. W. Gunn, McClary Mfg. Company, London, Ont.

Edward M. Hicok, cost accountant, Western Electric Company, Chicago.

B. D. Horton, president and general manager, Detroit Fuse & Mfg. Company.

L. G. Howlett, superintendent Industrial Works, Bay City, Mich.

F. W. Huber, superintendent of production, American Rolling Mill Company, Middletown, Ohio.

R. T. Herdegen, vice-president and general manager Dominion Forge & Stamping Company, Walkerville, Ont.

John H. Kasley, manufacturing engineer, Western Electric Company, Hawthorne, Ill.

Dr. William Kent, consulting engineer, New York.

Theron S. Langford, president Ann Arbor Machine Company, Ann Arbor, Mich.

J. J. Lippincott, assistant production manager, Walker Weiss Axle Company, Flint, Mich.

A. N. MacNeill, Detroit Pressed Steel Company.

F. A. Macnutt, Western Electric Company, Chicago.

Dwight V. Merrick, consulting engineer, New York.

Chester T. Morey, assistant superintendent, Rhode Island Tool Company, Providence, R. I.

L. A. Miller, office manager, Willys-Overland Company, Toledo, Ohio.

Seymour Neubecker, superintendent, Merritt Mfg. Company, Lockport, N. Y.

J. E. Otterson, general superintendent, Winchester Repeating Arms Company, New Haven, Conn.

E. B. Perry, manager Industrial Works, Bay City, Mich.

Dr. Harlow S. Person, director Amos Tuck School of Administration and Finance, Dartmouth College, Hanover, N. H.

John T. B. Rheinfeldt, chief of time study, Packard Motor Car Company, Detroit.

G. E. Schultz, Tabor Mfg. Company, Philadelphia.

G. O. Smith, efficiency engineer, Detroit Steel Casting Company.

W. J. Sorrow, superintendent of production, Winchester Repeating Arms Company, New Haven, Conn.

D. G. Stanbrough, Packard Motor Car Company, Detroit.

J. Rolland Stewart, assistant superintendent, General Aluminum & Brass Mfg. Company, Detroit.

F. R. Still, secretary and chief engineer, American Blower Company, Detroit.

R. A. Taylor, engineer Taylor Instrument Company, Rochester, N. Y.

W. A. Thiel, production superintendent gun department, Winchester Repeating Arms Company, New Haven, Conn.

Charles Vallone, factory manager, Barcalo Mfg. Company, Buffalo.

F. M. Vawter, works manager, and W. A. Vawter, general manager, Baker-Vawter Mfg. Company, Benton Harbor, Mich.

W. F. Wakefield, F. W. Wakefield Brass Company, Vermilion, Ohio.

S. Edgar Whitaker, consulting engineer, Saxonville, Mass.

J. H. Williams, president, J. H. Williams & Co., Brooklyn.

E. T. Williams, vice-president, J. H. Williams & Co., Buffalo.

Foreign Trade Convention Proceedings

The secretary, Robert H. Patchin, has issued from the office of the National Foreign Trade Council at New York the official proceedings of the third National Foreign Trade Convention which was held at New Orleans, Jan. 27 to 29, 1916. A 530-page octavo volume is required for the papers and discussions. In the foreword it is pointed out that the New Orleans convention crystallized in studious expression the thoughts of business men from all parts of the country on the commercial problems which the war has produced, and the volume is published with the hope that further study of the proceedings will enable all business men and those in public authority to find a solution of these problems. The book brings together an unusual amount of expert opinion on the foremost commercial questions. A limited edition has been published and copies can be had at $1.50 each, postpaid, on application to the secretary, India House, New York.

New Conditions for Steel Plate Buyers

Buyers of steel plates are facing new conditions, in that they are likely soon to pay higher extras or at least to find higher costs owing to special extras. The situation has been developing some time. It would appear that mills having an advantage over others in respect to width of plate are going to ask an extra on this account. In fact, such extras have already been in use in some cases, and for weeks the extra for marine steel has been twice to five times that ordinarily accepted.

Besides the subdivision of extras, it is said that with some mills a new form of contract is about to be used. This provides that no cancellation of the amounts covered by the contracts will be allowed or any rebating of price in the event of a market recession during the life of the contract. It is likely that such contracts will be limited chiefly to those plate users which do not fabricate the material as a commercial article for subsequent competitive sale. Railroads, when covering for repair work, would doubtless come in the class affected. With the present market conditions, the amounts contracted for, it is believed, will be limited to the monthly average, say, of this year or at most of the last six months.

Besides the special extras for widths, a new designation or classification is meeting with favor among the mills. This is to lie between tank steel, taking the base price, and boiler and flange steel, the extra for which will be raised. The new classification is to be known as pressing steel, for the purpose indicated by its name but not necessarily of boiler or flange quality. It will take an extra of 0.10c. per pound, while the boiler and flange extra will be 0.15c. The pressing steel will be merely so stamped and will not be sold with more than the melt record as to its physical characteristics.

Steel plates to meet the boiler code specifications, an extra soft steel, will take the locomotive firebox extra of 0.50c. per pound. For an indefinite time the extra on marine steel is to be supplied only on application. The new width extras cover the lighter plates and, in cents per pound, are as follows:

Gages under ¼ in. to and including 3/16 in.:	
Up to 72 in wide	0.10
72 in. to 84 in	0.20
84 in. to 96 in	0.30
96 in. to 100 in	0.40
100 in. to 102 in	0.45
Gages under 3/16 in. to and including No. 8:	
Up to 72 in. wide	0.15
72 in. to 84 in	0.25
84 in. to 96 in	0.35
Gages under No. 8 to and including No. 10:	
Up to 60 in. wide	0.30
60 in. to 64 in	0.35

Foundrymen's Meeting at Hartford

The New England Foundrymen's Association held its monthly meeting, May 10, at the Allyn House, Hartford, Conn. The afternoon was given over to an automobile ride through some of the interesting hill country and the Hartford suburbs and dinner was served at 7 o'clock. Following the dinner was a sharp and interesting discussion of the need and probable usefulness of a classification of castings for the purpose of making quotations. As the result of the discussion, the president was authorized to appoint a committee to give some study to the matter and report at a later meeting. The general subject of foundry costs was discussed at some length and several manufacturers advocated the employment of expert accountants to formulate a uniform system of accounts and foundry costs similar to that prevailing among the members of the National Machine Tool Builders' Association.

C. L. Newcomb of the Deane Steam Pump Company, Holyoke, Mass., discussed the foundry safety code situation in Massachusetts, and the probability of a similar measure being brought before the next legislature in Connecticut. His remarks elicited considerable interest and it is probable that the Connecticut members of the association will take further steps in regard to the formulation of a foundry code or the adoption of the code promulgated by the National Foundrymen's Association.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: New England Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

The Steel Trade's Future

The uncertainties of the steel industry are so well understood that a caption like "The Steel Trade's Future" will not lead the reader to expect much more than he will likely obtain. There are numerous angles from which the prospect can be viewed. From no single one can deep vision be attained, but the more angles from which a view is sought the greater is the power of penetration.

There is, for instance, the angle obtained by observing the duration of past periods of activity in steel. The steel trade is finding more reason for regarding the present demand as a domestic demand, while recognizing that it was the war that made the country so prosperous as to develop this home consumption. To measure the period of time in which there has been substantially a full demand necessitates establishing the starting and finishing dates. The finishing date is more clear cut than the starting. For the sake of uniformity we adopt in this case the month in which pig-iron production broke its previous record. The duration of activity in the three movements preceding this may be taken as follows: January, 1905, to October, 1907, making two years and ten months; September, 1909, to April, 1910, eight months; October, 1912, to October, 1913, thirteen months.

By the rule adopted, the present period of activity began with September, 1915, so that it is now in its ninth month. It has already passed the 1909 movement. At the end of next September it will have equaled in length the movement of 1912-13. It must last more than two years still, or to July 1, 1918, to equal in length the movement of 1905-6-7. The average length of the last three movements was a year and a half. At the end of next February such a period will have elapsed.

Passing to another angle, one may consider the question, When will the needs of the country have been satisfied? With the orders placed to date the railroads are not satisfied. The rate of freight-car buying has been greatly curtailed, but simply on account of high prices and poor deliveries. Some cars have even been bought at very high prices. A recent order placed by a Western road was for cars of the old-fashioned wood construction, purely as a makeshift. One might suppose, from certain considerations, that the heavy demand for steel from the automobile industry would soon be over; but the automobile makers evidently do not think so, as they would hardly increase their productive facilities merely for one season's full run. At the same time it is well to consider that the last income tax report showed a total of only 275,000 incomes in the United States of $4,000 a year or more; against which is to be set the fact that at the beginning of the year there were about 2,200,000 automobiles licensed in the United States, with the season's make, up to the end of next July, estimated at 1,250,000 to 1,400,000. How the country can absorb automobiles at such a rate is difficult to understand, but the builders may be assumed to know something about their business.

The demand for tubular products of all descriptions, outside of the small proportion taken for war purposes, is not of a nature to find itself satisfied after a period of buying of a prescribed length. Oil development, if circumstances dictate, can proceed continuously. Many other descriptions of tubular goods are articles of current consumption, certainly with no definite time limit.

Sheets and tin plates are almost exclusively commodities of everyday consumption, such as may continue indefinitely. Much the same may be said of wire products, but with the modification that there is at present an exceptional war demand, so that the current output of wire is no measure of domestic conditions in that trade. One fact bearing on postponed demand is that barb wire buying is curtailed by high prices.

In the case of structural material the theory more commonly held is that the war operates to postpone permanent investments and that a termination of the war is likely to increase the volume of new projects requiring structural steel.

Thus from the angle of considering whether the needs of the country may be found satisfied when active buying has proceeded for a definite length of time there is not much suggestion that a time limit must necessarily be set to any period of heavy demand for steel.

Sometimes the bell is rung on an active steel market when buyers conclude, from market indications, that it is better to draw upon their stocks than to add to them. On close analysis it might have been found at times in the past that buyers actually produced the condition they feared, of a decrease in the demand upon the mills for steel. It

is the common view at present, however, that while some stocks of steel have been accumulated by buyers, as in the automobile industry, such accumulation is not common, and at present prices is not likely to be. According to this theory, if the signal were given to trim sail, as by the ending of the war, for instance, the dislocation, through sudden efforts of buyers to reduce stocks, would be less than at some similar junctures in the past.

Another observation may be made—that month by month steel production costs are rising and expensive habits are being assumed that must be thrown off after the war. Steel manufacturers may conclude that it will be to their interest to readjust their production costs rather than to strive to encourage buyers to continue buying steel at a high rate. During the progress of such readjustment demand for steel would bank up, and eventually there would come what would have to be regarded as a distinctly new buying movement.

These are only a few of the angles from which an effort may be made to scrutinize the future of steel, apart from the most commonly taken view of what the belligerents will do when they cease being belligerents. The last is a viewpoint which, as time goes on and the country continues to accumulate wealth, may be found to have been overrated as to the insight it affords into the future.

Steel Castings for War Purposes

That steel castings are an important factor in the conduct of a great war is demonstrated by an analysis of Germany's steel output for 1915 as compared with 1914 and 1913. The following table is based on official data given in metric tons:

	1915	1914	1913
Total steel output	13,187,616	14,973,106	18,958,819
Acid steel castings	193,026	87,243	109,329
Basic steel castings	501,489	211,095	253,587
Total steel castings	694,515	298,338	362,916
Steel castings, per cent of total	5.26	1.99	1.38

Thus the percentage of castings increased under war conditions from 1.38 in 1913 to 5.26 in 1915. Actual tonnage more than doubled, being 57,876 tons a month in 1915 against an average of 55,083 tons for 1913 and 1914. The proportion of basic and acid castings changed but little, being about 70 to 72 per cent of basic and 28 to 30 per cent of acid castings.

This unusual expansion is understood to be due largely to the great demand for motor trucks and automobiles for war purposes. The cast steel motor truck wheel has been developed to a very great extent in Germany, making possible the easy mobilization of the large howitzers and other guns as well as the transportation of supplies and ammunition under severe conditions. The steel foundryman and automobile truck builder in this country may perhaps profit by these facts. Previous to the war the pouring of cast steel truck and automobile wheels was not entirely successful here, importations from France and Belgium having been relied upon largely. A stimulus has now been imparted to the art here at least to the extent that motor trucks for exportation have required such wheels, and it is believed the industry will be equal to whatever home demand may be made upon it.

A Widening Market for Furnace Slag

One of the interesting developments of recent months has been the lifting of blast furnace slag to a higher plane of usefulness. A number of companies have been formed to market broken slag as a substitute for stone or gravel in concrete making. At different times for years slag has been used for railroad ballast and as a base for highways, but the literature extolling the merits of the material did not seem to make a lasting impression. The seed thus planted has taken root, however, and now crushed slag has apparently become a commercially valuable by-product of iron making.

So confident are those engaged in this relatively new business that they have embarked on advertising campaigns appealing to general contractors. They urge the lower cost of furnace slag as compared with stone or gravel for concrete work; emphasize the fact that it is 20 to 30 per cent lighter than the materials they would have it replace, so that for equal strength dead loads may be lessened; point out how its cellular structure and chemical composition give it a mechanical and chemical bond not possessed by the other aggregates, and lay stress on its hardness and toughness and absence of brittleness and thus absence of cleavage planes or internal stresses. The increasing costs of the commonly used aggregates for concrete and road making promise a paying market for other hitherto little considered slag piles.

CORRESPONDENCE

Recovering Nitrogen from Air

To the Editor: In the article "Status of American By-Product Coke," by Thomas C. Clarke, the incorrect statement appears that the invention of recovering nitrogen direct from the air was made by a German chemist, and, further, that it was not commercially successful before the outbreak of the war. This invention was made by Professor Birkeland, a Norwegian, and was brought to a successful completion in 1908 at the large plant at Notodden, Norway, by him in conjunction with S. Eyde. They had at the beginning of the war several other plants in operation, the largest having available power of 40,000 hp.

HENRIK OWESEN.

Munhall, Pa., May 12, 1916.

The Labor Problem in the Metal Trades

To the Editor: Your editorial in the issue of May 4, entitled "Something to Meet," brings vividly to mind the experience and observation of many years in the handling of labor in metal-working lines. That employers should hesitate to make extensions to meet the growing and profitable demands of business through fear of labor troubles is certainly an anomaly, and indicates a condition for which there is no real justification. Why should any one employer or community of employers, no matter how great the demand for labor, submit to a closed shop condition which can be avoided so easily? The decision as to whether a shop shall be "closed" or "open" is entirely in the hands of the employer, and to an alert management closed shop conditions are impossible. That labor should be demanding closed shops and exorbitant wages is nothing more than we must expect. Labor would not be human if it did not reach out for all it can get, particularly under the stimulus of prosperous industrial conditions and

constant labor agitation. Labor and capital are both entitled to all that sound economic conditions will permit, but they should not forget that there will always come a time when abnormalities must be eliminated. The inexorable law of compensation will take care of that. Readjustment sooner or later is certain.

I believe that the labor problem is for the employer to solve; that the solution is almost entirely in his own hands. Labor can be led in the right direction almost as easily as in the wrong direction. In fact, I have found that the cause of practically all trouble at the bottom of the industrial ladder can be traced directly to a "loose screw" at the top. M. COKELY.

Cleveland, Ohio, May 10, 1916.

MANUFACTURERS' CONVENTION

National Association of Manufacturers Holds Its Twenty-first Annual Meeting

With "conservation of American industry" as the keynote, the twenty-first annual convention of the National Association of Manufacturers was held at the Waldorf-Astoria, New York, on Monday, Tuesday and Wednesday of this week. At this "coming of age" celebration, a presentation of the industrial situation all over the country was made by officers of national trade associations and State employers' associations. In this way it was hoped to obtain such general information as to industrial conditions throughout the United States as would assist the convention to formulate a comprehensive program looking to the upbuilding and conservation of industry in this country during the next few years when this country may have to face rigorous conditions through the sharper competition of Europe.

Prominent in the long list of industrial leaders who thus addressed the convention were William H. Barr, president National Founders' Association, whose subject was "Industrial Conditions in the Foundry Trade"; G. M. Gillette, president Minnesota Employers' Association, "Our Industrial Future"; and Charles J. Graham, president American Hardware Manufacturers' Association, "Present Business Problems."

Colonel George Pope, president of the association, who has long favored a national federation of all employers, in his annual address again committed the association to the policy of the open shop, and said that conditions to follow the war would make it essential for employers to perfect a new and powerful organization to combat the claims that would then be made by labor. He said:

> After the war millions of men liberated from the armies must seek a living in industrial work. To prepare ourselves for this condition there must be a new accounting of costs in our labor market. We have, for the time being, the world's markets at our door. But the countries now at war, when it is ended, must fight for their very industrial existence.

After referring to the great industrial activity of the nation, he said:

> Abnormal profits have been the exception, not the general rule. But labor frequently fails to observe this distinction. Demands and reprisals are sought under conditions which are not fair to employers who have not been the beneficiaries of peculiar and streaky industrial advantages during the last year and a half.
>
> The present time represents unprecedented opportunity for a policy of getting together. It is an era requiring economic standardization. It is an epoch ripe for industrial patriotism. The difficult problem of a standardized wage scale; the complex problem of hours of labor; the question of the relation of the state to private industry, and the many claims made for social legislation, are all a part of the scheme of government under which we live and by which our industrial growth must continue.
>
> In my opinion there should be an organization of employers, not confined to any one craft or exclusively to manufacturers, but one to which all employers of labor should be eligible.

Colonel Pope recommended to American manufacturers a close study of the German industrial system founded on co-operation under the sanction of the Imperial Government. His views regarding an association of all employers were heartily indorsed by other speakers and such a movement was characterized as the greatest ever undertaken by American business men to reach a solution of the ever-recurring quarrels between capital and labor. It was said that this year, when American labor had received more in wages than ever before, only to instigate a great number of industrial troubles, was the most opportune time for the launching of such a project.

The members of the association went on record in resolutions calling for the improvement and extension of railroads as a part of national preparedness. They further urged Congress to take steps for the regulation of all lines of traffic as a measure for national defense and authorize railroads to fix such rates as will insure reasonable earnings on capital invested.

Interesting reports were presented by various committees appointed at last year's convention. The committee on banking and currency dwelt upon the desirability of the establishment of an industrial bank through the co-operation of manufacturers. An independent bank for foreign trade was declared to be another great need. The proposition to make the financing of trade acceptances universal in the widest sense also was approved. That the Federal bankruptcy law should be perfected was the report of the committee on bankruptcy. The members declared the association should arrange to oppose the repeal of this law. Urging a campaign of education, the committee on fire prevention declared that an astounding situation is being bred in this country; the fact that an insurance company will be able to avoid payment makes it exceedingly difficult to get a jury to convict a person accused of arson. The committee on industrial betterment made a preliminary report on sickness insurance and further asked for more time to consider the minimum wage question. A plea for the removal of barriers branded as antiquated, absurd and useless was made by the committee on interstate commerce, which indorsed the possibilities and value of an intelligent plan for Federal incorporation. Praise was given the Stevens-Ives bill now before Congress by the committee on patents.

In connection with the convention, in an adjacent suite of rooms was an export trade exhibition, features of which were sections devoted to packing, merchant marine, the handling of export orders (illustrated by actual documents), samples of foreign made goods with wholesale and retail prices (an elaborate collection gathered by agents of the United States Bureau of Foreign and Domestic Commerce), etc. Booths were assigned to the principal foreign trade divisions, at some of which were natives or former residents in attendance to afford detailed trade information.

Alloys Used in Zeppelin Construction

The alloys entering into the construction of a Zeppelin brought down in France are given as below by the *Revue des Produits Chèmiques*, with their analyses:

	Angle Brackets, Per Cent	Channel Sections, Per Cent	Braces, Per Cent
Aluminum	90.27	88.68	99.07
Zinc	7.80	9.10	0.13
Iron	0.45	0.43	0.38
Silicon	0.37	0.49	0.36
Copper	0.73	0.70	0.06
Tin	0.11	0.15	...
Manganese	0.27	0.45	...
Nickel	Trace	Trace	Trace

The braces are evidently commercial aluminum, while the other parts are alloys of aluminum, zinc, copper and manganese. The absence of magnesium is noticeable. The impression has been that this metal was extensively used, at least as an alloy.

The Morgan Construction Company, Worcester, Mass., has secured a contract for fourteen gas producers for the plant of the United Steel Company, Canton, Ohio. This is the largest single order of the kind it has ever received and about six months will be required to complete the installation.

STEEL CORPORATION CHANGES

Ward B. Perley General Manager of Canadian Company and John Hughes Assistant to President

Two important appointments in the United States Steel Corporation's organization have become effective in the past week, due to the decision of the directors to go forward with the construction of the Canadian steel works for which general plans were announced more than three years ago. Chairman Gary has been elected president of the Canadian company, known as the Canadian Steel Corporation, Ltd., and Ward B. Perley has been elected vice-president and general manager in charge of construction. Mr. Perley is now at Ojibway, Ontario, where the new works are to be built, this being the renamed town of Sandwich, which is nearly opposite Detroit on the Detroit River. He will soon take up his residence there.

WARD B. PERLEY

JOHN HUGHES

Previous to his appointment as assistant to President Farrell in May, 1911, Mr. Perley was assistant to W. B. Dickson, when the latter was vice-president of the Steel Corporation, having to do with blast furnace operations and with purchases of pig iron and old material. Mr. Perley's experience in iron and steel works operation dates back to the eighteen-eighties, when he was connected with the Franklin Iron Works Company, operating a blast furnace at Columbus, Ohio. Later he had charge of various operations of King, Gilbert & Warner, who had the Moxahala furnace in Hocking Valley and the Standard Nail Company's rolling mill and cut nail works at Middleport, Ohio. Mr. Perley completed the construction of a Bessemer steel plant at Middleport, and later was active in the management of the Cherry Valley Iron Works at Leetonia, Ohio. In 1899, when the National Steel Company acquired the King, Gilbert & Warner Company, Mr. Perley went to Chicago as assistant to Riley Gilbert, vice-president in charge of the operating department. In 1901 he became connected with the New York offices of the Steel Corporation.

John Hughes, for the past thirteen years general agent of the United States Steel Products Company, has been appointed assistant to the president of the Steel Corporation in view of Mr. Perley's election as referred to above. Mr. Hughes previous to his connection with the Steel Corporation had been for seventeen years in the customs service and was well known as an expert on iron and steel and machinery on the New York appraiser's board. He was born in Brooklyn fifty years ago, started in business life as an office boy, and before his Government work had four years' experience in Hudson River transportation.

Appreciation of Carnegie Employees' Action in Strike Troubles

Chairman E. H. Gary of the United States Steel Corporation sent the following telegram on May 11 to Judge J. H. Reed, Pittsburgh, chairman of the Carnegie Steel Company, in recognition of the stand taken by employees at certain of the latter company's works in the Pittsburgh district whom strikers from plants of other companies tried to persuade to go out in the recent disturbances:

"The Steel Corporation and all its subsidiaries highly appreciate the courage, loyalty and fairness displayed by the employees during the recent labor troubles. They have clearly demonstrated a desire to reciprocate what they believe to be a reasonable attitude on the part of their employers. And they have set an example which will have widespread influence for good. We must never waver in our effort to be considerate and just in our treatment of all questions affecting their welfare. Their interests and ours are mutual and interdependent. I heartily congratulate our local officials on the tact and good judgment shown under the trying difficulties now happily ended."

The Electric Steel Castings Company, Milwaukee, Wis., broke ground May 8 for its electric steel foundry in West Allis. The plans call for three buildings, of steel skeleton, brick and concrete. One is 40 x 200 ft., one story; one, 30 x 80 ft., 60 ft. high, and one for a boiler house, 30 x 40 ft. Work will be rushed so that operations on orders already booked may start with the least possible delay.

Reports that the Ashland Iron & Mining Company, Ashland, Ky., had decided to build finishing mills, and had placed contracts for them and for the equipment, are premature. The company is considering the matter of adding some finishing mills, but a definite decision has not been reached nor have any contracts been placed.

Midvale Acquires Diamond State Steel Company Plants

The Midvale Steel & Ordnance Company announced at Philadelphia, May 10, that it had acquired the property of the Diamond State Steel Company at Wilmington, Del., including 50 acres of land, five open-hearth furnaces, a 34-in. blooming mill and five bar mills. The Wilmington plant, following the receivership some years ago, passed into the hands of Daniel J. Driscoll, of Reading, Pa., and associates, and recently it had been the expectation that the property would be taken over by the Delaware Steel & Ordnance Company. A number of improvements had already been made with a view to getting the open-hearth plant in operation. It is expected the plant will start up in part by the middle of June and that there will be full operation by July 1. The steel for a time will probably be shipped to the Nicetown plant of the Midvale Steel Company, the desirability of increasing the steel supply of that plant prompting the purchase. A new corporation, known as the Wilmington Steel Company, has been formed to take over the operation of the Diamond State Steel Company works. Its officers are the same as those of the Midvale Steel Company—A. C. Dinkey, president; W. P. Barba, vice-president; H. M. Deemer, secretary, and W. G. MacFarland, treasurer.

The Diamond State Steel Works consisted originally of puddling mills, heating furnaces and two bar mills, built in 1868 and burned and rebuilt in 1891. The steel department was added in 1899-1900. The product was splice bars, track bolts, spikes, merchant bars, rivet rods, horseshoe iron, horseshoes, forgings and steel castings.

New Sheet Mill at Niles

Jacob D. Waddell, who resigned several months ago as manager of sales of the Brier Hill Steel Company at Youngstown, Ohio, has purchased 65 acres of land on the south side of the city of Niles, Ohio, for a sheet mill. Plans call for a steel building 570 ft. long and 140 ft. wide, to contain three traveling cranes, two of 60-ft. span in the main building and one in a 50-ft. lean-to. In the main building there will be six hot sheet mills, three roughing mills and six cold mills, but foundations will be put in for eight hot sheet mills, four roughing mills and eight cold mills, the intention being to add the other mills later. All will be electrically driven. The greater part of the output will be highly finished black sheets and no galvanized or roofing sheets will be made at the start. The heating and pair furnaces will be separate, and gas producers will be installed for furnishing gas to the furnaces. All negotiations and contracts so far have been made by J. D. Waddell personally, but his intention is later to incorporate a company of which he will be president.

Important Motor Accessory Consolidation

The United Motors Corporation, to underwrite the stock of which a syndicate is now forming, will be a holding corporation, owning the securities of five of the leading automobile accessory manufacturers in the country. The new company is incorporated under the laws of New York and will have an authorized capitalization of 1,200,000 shares, no par value. The combination is being financed by L. G. Kaufman, president Chatham & Phoenix National Bank, New York. The banking houses of issue are Dominick & Dominick, J. S. Bache & Co., New York, and W. W. Laird, Wilmington, Del.

The companies to be included are the Dayton Engineering Laboratories Co., Dayton, Ohio; Hyatt Roller Bearing Company, Harrison, N. J.; New Departure Mfg. Company, Bristol, Conn.; Remy Electric Company, Anderson, Ind., and Perlman Rim Corporation. The five subsidiary companies will be operated individually as heretofore and the personnel of officers and working forces will continue unchanged. No company loses its identity and the management of each remains in the same hands which have successfully developed it to date. The United Motors Corporation is spoken of by its promoters as in effect a co-operative arrangement among non-competitive interests in the automobile field which will insure a steady market for the product of each of the factories included and guarantee satisfactory sources of supply of ball and roller bearings, starting and lighting systems, demountable rims, magnetos, axles, transmissions, etc. It is stated that the company will have steel and tube mill connections.

The board of directors of the United Motors Corporation, the parent company, will consist of representatives of the management of the subsidiary concerns.

A. M. Byers Company Leases Columbia Mills

The A. M. Byers Company, Inc., Pittsburgh, maker of wrought-iron pipe, which also owns and operates the Mattie blast furnace at Girard, Ohio, has leased for three years the plant of the Susquehanna Iron Company at Columbia, Pa. The plant consists of the Columbia works and the Susquehanna works, the two being a quarter of a mile apart. The lease was made from W. W. Griest and associates, who have controlled the mills for some years. The Susquehanna works consist of a puddle mill, with 32 single furnaces and equipment of squeezers and muck bar mill. It will make puddled iron for the Columbia mill, which also contains a puddling plant of 28 single puddling furnaces, an 18-in. skelp mill, on which will be rolled iron skelp from 4¼ in. up to 15 in. wide, and also a 10-in. mill on which will be rolled iron skelp 1 11/32 in. up to 7⅞ in. wide. The pipe mill at Columbia contains one butt weld and one lap weld furnace. It is equipped to make 70,000 to 75,000 tons a year of ¼-in. to 12-in. iron pipe, of which about 25,000 tons will be butt weld and 45,000 to 50,000 tons lap weld.

For some years the Eastern and Western trade of the A. M. Byers Company in puddled wrought-iron pipe has been extending, and the lease of the Columbia mills was for the purpose of taking better care of it. The output of Columbia will go to the Eastern trade, and thus a much larger part of the output from the South Side, Pittsburgh, mills will go to its Western trade. The company takes possession on June 1, and forge iron for its puddling plants at Susquehanna and Columbia will be furnished from its blast furnace at Girard, Ohio, which also furnishes forge iron for its South Side mills. It is the intention to put the Columbia mills in good physical condition, and considerable new equipment will be added as soon as definite plans are made. D. F. Manice, now in the Pittsburgh mills, has been appointed manager of the Columbia works, L. M. Johnston being general manager. At the South Side mills the company is adding a 750-kw. turbo-generator unit, which is being furnished by the Kerr Turbine Company, Wellsville, N. Y.

Ferromanganese from the Temple Furnace

Another ferromanganese operation is announced for eastern Pennsylvania, making the fourth in that territory recently. The Seaboard Steel & Manganese Company, a new organization incorporated in New York State, will make ferromanganese in the Temple furnace at Temple, Pa., which it has acquired. It will use ores which the United States Manganese Corporation, whose formation was announced in THE IRON AGE, March 30, 1916, is now starting to mine from its deposits at Elkton, Va. The new company has a one-half interest in this mine under a purchase contract. It is expected that the production of ferromanganese will be under way by the middle of June. The officers of the Seaboard Steel & Manganese Company are Hartley C. Wolle, president, formerly assistant superintendent of the Cambria Steel Company; Albert Broden, vice-president; J. E. Sullivan, secretary and treasurer, with W. R. Hopkins, M. P. Dalton and Lloyd Atkinson directors. The new company is financed by White & Co., and the executive offices are at 5 Nassau Street, New York. The general office will be at Reading, Pa.

WAR MATERIAL PLANTS

A $5,000,000 Appropriation Proposed, but All Defense Measures Are Held Up

WASHINGTON, D. C., May 16, 1916.—The Sixty-fourth Congress has now been in session more than five months, during which time there has been constant agitation throughout the country of the importance of improving the national defense, but not one of the annual appropriation bills dealing with the subject has yet been taken up for consideration by either house nor has the committee charged with the duty of providing the necessary revenue to meet the current deficit in the Treasury and the increased cost of the preparedness program given any serious attention to the subject.

The majority leaders in Congress, after deliberation in caucus, have determined to use the national defense supply bills as weapons with which to force through the Administration's entire legislative program, which contains a number of measures to which many members of the majority party in both houses are opposed. As soon as Congress was fairly committed to the national defense program, the Administration served notice on the leaders that the Philippine independence bill, the Porto Rican government bill, the new Federal shipping bill, certain conservation measures and several other legislative propositions must be considered before adjournment. In pursuance of the majority leaders' decision, the Philippine independence bill has been passed by both houses, but amended out of all resemblance to the original measure. The Porto Rican government bill is now under consideration and the shipping bill, modified to provide for the withdrawal of the Federal Government from participation in the ownership and operation of merchant vessels five years after the close of the European war, will be called up in a few days.

The Fortifications bill has been on the House calendar more than a month, with no prospect of being considered before June 1. Work on the Army appropriation bill is progressing slowly in the House Military Committee, but the completion of this measure has been prevented by the long wrangle between the House and Senate conferees on the bill providing for the reorganization of the personnel of the army, the two houses haggling over the question as to whether the regular army shall be limited to 180,000 or 250,000 men, either figure being regarded by military experts as wholly inadequate. Work on the Naval bill has been proceeding leisurely and the announcement has already been made that this measure will not be taken up in the House until after the Presidential conventions. It is barely possible that the Fortifications bill may become a law before the beginning of the new fiscal year, when its provisions become effective, but there is no prospect whatever that the Army or Navy bill will be enacted in time to provide for the support of these establishments.

Very earnest efforts are being made by certain members of the House Military Committee to secure the adoption in the Army bill of a provision similar to that incorporated in the Fortifications bill, setting aside a considerable sum for the equipment by the War Department of a number of private plants for the manufacture of war material for the Government. The figure now discussed for this purpose is $5,000,000, which would provide for the equipment of six or eight well located and efficiently operated private plants with patterns, jigs, gages, automatics, etc., for the production of the service rifle, revolver, automatic pistol, etc. The present plan contemplates that each of the plants thus equipped shall contract to furnish annually to the Government a sufficient quantity of these arms to keep its equipment in running order. There would, of course, be little or no profit in such small contracts, but should an emergency arise the volume of output would be largely increased and the terms adjusted on a reasonable commercial basis. W. L. C.

A new zinc smelter, it is reported, will be erected at Terre Haute, Ind., by the Grasselli Chemical Company, which already has such smelters at Clarksburg and Meadowbrook, W. Va.

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Iron and Steel Markets

STEEL BILLETS EASIER

Less Stress in Finished Material Market

Plate Mills Filling Up with Shipyard Orders for 1917—Implement Bars for Next Year

Some increase in the amount of semi-finished steel available for early delivery in the Pittsburgh district is the latest indication of lessening strain in the steel trade. As additional new capacity is finished in the next four or five months less is likely to be heard of a steel shortage.

Pig iron, coke and old material have been the yielding sections of the market for several weeks. Now billets and sheet bars show indications, though not pronounced, of a shading off from famine prices. Under freer offering, open-hearth billets and sheet bars have sold at $42 to $43 at Pittsburgh as against $45 in recent weeks.

At the same time leading steel companies have no semi-finished steel to offer and others are as rigid as to prices as in the most feverish buying of January and February. The position as to war steel is in no wise relaxed, particularly where there is urgency about deliveries. Some steel for large shells wanted promptly has been offered to a number of mills but none could take it on. There is considerably more buying to be done for both France and Italy. Of 150,000 tons of 6 to 12-in. blooms for Europe recently before the market 50,000 tons remains to be placed.

The enormous demands of shipyards as a factor in sustaining plate prices regardless of the war are getting more attention. The Steel Corporation's latest bookings include 50,000 tons of plates and shapes for vessel work, delivery in the second half of 1917, and one large plate producer has contracted with shipbuilders to supply half its entire output in the same period.

Japanese buyers have scoured the country for plates for their shipyards, but have been able to place but a portion of the thousands of tons needed for vessels wanted before July 1, 1917. They paid 4c. on one contract and were not staggered by 4.5c.

Plate manufacturers are promulgating new extras that provide more steps in widths and will work out relatively higher prices than heretofore for the wider plates.

A total of 50,000 tons of new subway and elevated work is soon to be placed in New York and bridges still figure prominently in Eastern lettings. In the West, however, there is more evidence that high prices are cutting down fabricating operations. In April the new work let amounted to 72.5 per cent of full capacity, which is rated at 172,000 tons a month. In March the bookings were 102 per cent of capacity and the average for the first quarter was 82 per cent.

Western implement manufacturers have shown some concern about their bar contracts for the first half of 1917 and the next few weeks are expected to bring much of that business to the steel makers. Lately 2.35c. Pittsburgh has been paid for agricultural bars and some Eastern sales are reported at 2.25c. Pittsburgh.

The centering of the world's tin-plate demand on the United States is rapidly taking up capacity, several large manufacturers now having nothing to offer for this year. Large export sales have been made at $5.50 per base box, and one to the Orient at $5.75, and the domestic market seems to be heading for $6. Specifications of the week on sheet and tin mill products have been unusual. One automobile builder's contracts for blue annealed sheets for the year beginning July 1 call for 250,000 tons.

Foundry pig-iron buying is uniformly light, and the week has been one of the quietest of the year. With spot buying absent and producers naming lower prices for 1917 than for the last half of this year, consumers are more disposed to let the market drift. At St. Louis 15,000 tons of basic is under negotiation, with the prospect that, though higher in phosphorus, Southern iron at $15, Birmingham, with $3.40 freight, will be taken in preference to Chicago iron at $20.50, delivered. Southern warrants have been quoted at $14.50 and less, and furnace iron has sold farther ahead at $15 than was recently the case.

The ferromanganese scare is subsiding, and spot prices have come off $100 or more, so that $325 sales are now rather common. The Tata Company is reported a seller of 1000 tons to the United States from its India plant.

Pittsburgh

PITTSBURGH, PA., May 16, 1916.

The weak spots in the market at present are foundry pig iron, coke and scrap, and the situation in mild open-hearth steel is easier. The strike of the molders in this district, which has been on since December, has cut down very much the local consumption of foundry pig iron, and a good deal is being offered for resale, the amount increasing rapidly. Coke is dull, with prices soft, despite the heavy restriction in output. There is no demand for scrap, and borings and turnings, low phosphorus melting stock and heavy steel scrap are particularly weak. The supply of semi-finished open-hearth steel is more plentiful and prices at which it is being sold show a wide range. The famine in this material seems to be disappearing, due to new capacity lately active in the market. All the Westinghouse works are again in practically full operation, but the local strike of machinists and molders is still on. The demands on the steel mills for finished material are still heavy, but there has been a general easing up in the situation, and prices have not shown any advances in the past week. If the orders now on the books of the mills are specified for, the present gait of operations will hold over the remainder of the year, but material

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

Pig Iron, Per Gross Ton:	May 17, 1916.	May 10, 1916.	April 19, 1916.	May 19, 1915.
No. 2 X, Philadelphia...	$20.50	$20.50	$20.50	$14.25
No. 2, Valley furnace...	*18.00*	18.50	18.50	12.75
No. 2 Southern, Cin'ti..	17.90	17.90	17.90	12.40
No. 2, Birmingham, Ala.	15.00	15.00	15.00	9.50
No. 2, furnace, Chicago*	19.00	19.00	19.00	13.00
Basic, del'd, eastern Pa.	20.50	20.50	20.50	13.25
Basic, Valley furnace ..	18.00	18.00	18.00	12.50
Bessemer, Pittsburgh....	21.95	21.95	21.95	14.55
Malleable Bess., Ch'go*.	19.50	19.50	19.50	13.00
Gray forge, Pittsburgh..	18.70	18.70	18.70	13.45
L. S. charcoal, Chicago.	19.75	19.75	19.75	15.75
Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh.	45.00	45.00	45.00	20.00
O.-h. billets, Pittsburgh.	*43.00*	45.00	45.00	20.00
O.-h. sheet bars, P'gh...	*43.00*	45.00	45.00	21.00
Forging billets, base, P'gh	69.00	69.00	68.00	26.00
O.-h. billets, Phila.....	50.00	50.00	50.00	22.02
Wire rods, Pittsburgh..	60.00	60.00	60.00	25.00
Finished Iron and Steel,				
Per Lb. to Large Buyers	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.47½	1.47½	1.25	1.25
O.-h. rails, heavy, at mill	1.56½	1.56½	1.34	1.34
Iron bars, Philadelphia..	2.659	2.659	2.659	1.17½
Iron bars, Pittsburgh....	2.60	2.60	2.50	1.20
Iron bars, Chicago.....	2.35	2.35	2.35	1.15
Steel bars, Pittsburgh....	3.00	3.00	3.00	1.20
Steel bars, New York...	3.169	3.169	3.169	1.369
Tank plates, Pittsburgh.	3.75	3.75	3.75	1.15
Tank plates, New York.	3.919	3.919	3.919	1.319
Beams, etc., Pittsburgh..	2.60	2.60	2.60	1.20
Beams, etc., New York.	2.769	2.769	2.769	1.369
Skelp, grooved steel, P'gh	2.35	2.35	2.35	1.15
Skelp, sheared steel, P'gh	2.45	2.45	2.45	1.20
Steel hoops, Pittsburgh..	3.00	3.00	3.00	1.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	May 17, 1916.	May 10, 1916.	April 19, 1916.	May 19, 1915.
Per Lb. to Large Buyers	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	2.90	2.90	2.85	1.80
Galv. sheets, No. 28, P'gh	5.00	5.00	5.00	3.60
Wire nails, Pittsburgh..	2.50	2.50	2.40	1.55
Cut nails, Pittsburgh...	2.60	2.60	2.60	1.55
Fence wire, base, P'gh..	2.45	2.45	2.25	1.35
Barb wire, galv., P'gh..	3.35	3.35	3.25	2.10
Old Material, Per Gross Ton				
Iron rails, Chicago.....	18.00	18.00	18.00	11.75
Iron rails, Philadelphia.	20.00	20.00	20.00	15.00
Carwheels, Chicago	13.00	13.00	14.00	9.75
Carwheels, Philadelphia..	*16.50*	17.00	17.50	11.50
Heavy steel scrap, P'gh	*17.00*	17.25	17.75	11.75
Heavy steel scrap, Phila	*16.50*	17.00	18.00	11.50
Heavy steel scrap, Ch'go	16.00	16.00	16.50	9.50
No. 1 cast, Pittsburgh..	16.25	16.25	16.00	12.00
No. 1 cast, Philadelphia.	17.50	17.50	18.00	12.25
No. 1 cast, Ch'go (net ton)	12.50	12.50	12.75	9.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$2.25	$2.25	$2.25	$1.50
Furnace coke, future....	2.50	2.50	2.50	1.65
Foundry coke, prompt...	*3.00*	3.25	3.50	2.00
Foundry coke, future....	3.25	3.25	3.25	2.15
Metals,				
Per Lb. to Large Buyers	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	29.00	29.00	28.75	21.00
Electrolytic copper, N. Y.	**28.62½**	28.50	28.50	18.75
Spelter, St. Louis.....	*15.25*	16.75	19.00	15.25
Spelter, New York.....	*15.50*	17.00	19.25	15.50
Lead, St. Louis.....	**7.40**	7.37½	7.62½	4.12½
Lead, New York.....	7.50	7.50	7.75	4.20
Tin, New York.....	*49.25*	49.75	51.00	38.25
Antimony, Asiatic, N. Y.	*33.00*	35.00	41.00	34.50
Tin plate, 100-lb. box, P'gh	**$5.50**	$5.00	$4.50	$3.15

that has been bringing very high prices, entirely out of proportion to costs, notably open-hearth steel, is expected to be lower in the summer months than now. This may have the effect of causing a readjustment in prices on finished iron and steel to some extent. The most active item on the list is tin plate, three or four of the largest makers saying they have none to offer for shipment this year. Export sales of large lots have been made at $5.50 and higher, and tin plate is expected to be squarely on a basis of $6 per base box by July 1. Probably the next most active heavy item is pipe, the mills being sold up to August or later, and on boiler tubes largely for the remainder of the year.

Pig Iron.—The local market is dull, and new inquiry is light. The United Steel Company, Canton, Ohio, which recently bought 5000 tons of basic for third quarter delivery for shipment from the Canal Dover furnace of M. A. Hanna & Co., has an inquiry out for 5000 tons more for May and June delivery. American Steel Foundries is inquiring for 5000 tons, probably for Alliance. The Westinghouse Electric & Mfg. Company is inquiring for 2000 to 5000 tons of foundry iron for delivery at its Cleveland works. This inquiry will likely bring out some low prices, and Southern iron will figure in it. Southern No. 2 is weak at $15, Birmingham, and can be put into Cleveland at less than the basis of $18, Valley furnace, for No. 2. If the prices are low enough, it is believed the Westinghouse Company will buy much more than 5000 tons. Prices on foundry iron have gone off, due to the dull demand, and $18 at Valley furnace for No. 2 could readily be done. We note a sale of 500 tons of Bessemer iron made to a New York house for shipment to Italy at $21, Valley furnace. We quote Bessemer iron at $21 to $21.50; basic, $18; gray forge, $17.75 to $18; malleable Bessemer, $18.50 to $19, and No. 2 foundry, $18 to $18.50, all at Valley furnace, the freight rate from furnace for delivery in the Pittsburgh or Cleveland district being 95c. per ton.

Billets and Sheet Bars.—The shortage in the supply of open-hearth steel, which has been a feature of the market for nearly a year, seems to have largely disappeared, the offerings in the past two or three weeks from unexpected sources being quite heavy. One large steel company, that has not been a seller in the open market for a year or more, has lately offered a limited amount of soft basic steel, this being available by reason of its excessive output, and also because of several finishing mills it is building being greatly delayed in their completion. Steel works located several hundred miles from Pittsburgh are offering steel here, and a Cleveland interest has also been a free seller. There is a wide range in prices, depending on the amount, how soon the steel is needed, and, to some extent, the buyer. Soft open-hearth billets and sheet bars have sold in a few cases at $42 to $43 or less, and yet the same kind of steel in the form of 4 x 4 in. billets has sold within two weeks at close to $50. One maker is offering billets and sheet bars for delivery in this district at about $42 to $43, and has made some sales. On the other hand, a Youngstown interest has largely oversold, and is inquiring for 35,000 to 40,000 tons of open-hearth steel. Bessemer steel is still scarce, and prices on it are very firm. We note sales of 3000 to 5000 tons of open-hearth billets and 2000 to 3000 tons of open-hearth sheet bars at $43 or less, f.o.b. Pittsburgh. On the other hand, some steel mills would not sell at this price, and, in fact, have no steel to spare over the remainder of this year. We now quote soft open-hearth billets and sheet bars at $42 to $45; Bessemer billets, $45; Bessemer sheet bars, $45, maker's mill, Pittsburgh or Youngstown district. We quote forging billets at $69 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 and up to 0.60 carbon take $1 extra.

Ferroalloys.—The scare in regard to future supply of ferromanganese has largely subsided, and, as a result, this material is being offered at lower prices. Consumers now seem to feel they will be able to get all the ferromanganese they will need by paying the price for it, and, as such a small percentage is used in making a ton of steel, they can well afford to pay the present high prices. We note sales of several carloads of 80 per cent domestic at $325 to $350, and one carload at $375, delivered, for prompt shipment. We quote the market on 80 per cent domestic ferromanganese at

$325 to $350, and prompt deliveries can be had at these prices. Spiegeleisen is still scarce and 20 to 30 per cent is held at $70 to $75 per ton delivered. There is also a scarcity in supply of ferrosilicon, but the situation is said to be easing up. We quote 50 per cent ferrosilicon at $85 for lots up to 100 tons, over 100 tons and up to 600 tons, $84, and over 600 tons, $83 all per gross ton, f.o.b. Pittsburgh. Prices of Bessemer ferrosilicon for delivery over remainder of the year are now quoted as follows, 9 per cent, $32; 10 per cent, $33; 11 per cent, $34; 12 per cent, $35; 13 per cent, $36.50; 14 per cent $38.50; 15 per cent, $40.50, and 16 per cent, $43. Seven per cent silvery for the same delivery is $28.50; 8 per cent, $29; 9 per cent, $29.50; 10 per cent, $30; 11 per cent, $31, and 12 per cent, $32. All these prices are f.o.b. at furnace, Jackson or New Straitsville, Ohio, or Ashland, Ky., each of these points having a freight rate of $2 per gross ton to Pittsburgh.

Steel Rails.—Only small orders for standard sections have been placed with the local mill since the recent advance. The demand for light rails is still very urgent, the Carnegie Steel Company being reported well sold up over the next three or four months. We quote light rails as follows: 25 to 45-lb. sections, 2.10c.; 16 and 20 lb., 2.15c.; 12 and 14 lb., 2.20c., and 8 and 10 lb., 2.25c., in carloads and up to 100 tons. An advance of 5c. per 100 lb. is charged for less than carloads and down to 3 tons, while under 3 tons an additional 5c. is charged. We quote standard section rails of Bessemer stock at 1.47½c., and open-hearth steel, 1.56½c., Pittsburgh.

Structural Material.—The Fort Pitt Bridge Works have the contract for 2600 tons for 19 small bridges for the Pennsylvania Lines East. The McClintic-Marshall Company has taken about 2000 tons more for additions to buildings of the Donner Steel Company, Buffalo, N. Y., and the Blaw Steel Construction Company has taken 4000 tons for extensions to the plant of the Kuhlman Car Company, Cleveland, Ohio. None of the structural mills is offering material on new contracts for delivery inside of five to six months, and shipments on present contracts are very much delayed. We quote beams and channels up to 15 in. at 2.60c. to 2.75c. at mill, for delivery in third and fourth quarters of this year. Small lots for prompt delivery from warehouse stocks are held at about 3.25c. to 3.50c. and higher.

Plates.—One or two mills in this district are reported to be able to furnish fair-sized quantities up to about 90 in. wide for delivery in four to six weeks, for which they ask 3.75c. to 4c. and are getting it. For shipment in three to four months fairly large contracts have been placed at 3.75c. to 4c. at mill. There have been no car orders in the past week, and inquiry from the railroads for all classes of supplies is light. We quote ¼-in. and heavier plates for delivery at convenience of the mill, which would mean probably last quarter, at 2.75c. to 2.90c., while for shipment in two to three months 3.50c. to 4c. and higher are quoted.

Sheets.—New orders are only fairly heavy, most of the trade being covered through second and third quarters, and in some cases over the entire year. The demand for blue annealed sheets is still strong, with the supply limited. One leading automobile builder is said to have bought for the year beginning July 1 close to 250,000 tons of blue annealed sheets, of which one producer took over 150,000 tons. Specifications on sheet and tin mill products of the leading interest on Monday, May 15, were the heaviest in any one day in its history. As the supply of open-hearth steel is larger, mills are making more prompt deliveries of sheet bars. Most mills are holding No. 28 black sheets at 3c. minimum, but there are still a few sellers that will quote as low as 2.90c. for delivery in three to four months. We quote Nos. 9 and 10 blue annealed sheets at 3c. to 3.25c., the lower price being for delivery at convenience of the mill, which would probably be in last quarter of this year. We quote No. 28 Bessemer black sheets at 2.90c. to 3c., and open-hearth, 3c. to 3.10c.; No. 28 galvanized Bessemer stock, 5c. to 5.10c., and open-hearth, 5.10c. to 5.15c., some mills quoting even higher prices. We quote Nos. 22 and 24 black plate, tin mill sizes, H. R. and A., 2.70c.; Nos. 25, 26 and 27, 2.75c.; No. 28, 2.85c.; No. 29, 2.95c., and No. 30, 3c. These prices are for carload and larger lots, f.o.b. mill, Pittsburgh.

Tin Plate.—The export demand is enormously heavy, and leading makers say they are turning down nearly every day business on which they cannot make the deliveries wanted. Three leading mills state that practically their entire output for this year is sold, and one producer has been trying to buy tin plate recently to help out on its obligations. We note a sale of about 23,000 boxes for export to Japan at $5.75 per base box, Pittsburgh. There would be no trouble in getting $6 on some export inquiries if the mills could make the deliveries. It is believed higher prices on tin plate will rule over the remainder of the year, and the market is very close now to $6 minimum per base box. We quote small lots from stock at $5.50 to $6 per base box, and for export, $5.75 to $6. We quote 8-lb. coated ternes at $7.75 for 200 lb. and $8 to $8.25 for 214 lb., all f.o.b. maker's mill, Pittsburgh.

Cold-Rolled Strip Steel.—The quickest delivery that any mill will promise is 22 weeks from date of order. Large contracts continue to be made with regular customers, and we note one contract for 600 tons for third quarter at $6, another of 300 tons for last half at $6, while small lots for delivery at convenience of the mill, which would be in five to six months, range from $6.50 to $7 per 100 lb. base. Some fairly large contracts have been placed at $6.25 for delivery in December and January. In view of the heavy demand, and the fact that the mills are sold up so far ahead, higher prices are likely. Extras, standard with all the mills, were given in full on page 810 of THE IRON AGE of March 30.

Skelp.—No new orders are being taken by local mills, as they are sold up for five to six months. Prices are nominal and premiums would have to be paid for fairly prompt shipment. We quote grooved steel skelp at 2.35c. to 2.40c.; sheared steel skelp, 2.45c. to 2.50c.; grooved iron skelp, 2.70c. to 2.80c., and sheared iron skelp, 3c. to 3.10c., all delivered to consumers' mills in the Pittsburgh district.

Nuts and Bolts.—The situation is as tight as ever, makers of nuts and bolts being sold up for five to six months ahead and unable to ship to customers as fast as goods are wanted. In some cases higher than regular prices are obtained, and a further general advance is expected in the next few days. The discounts, effective from April 20, which makers state are for prompt acceptance only, are as follows, delivered in lots of 300 lb. or more where the actual freight rate does not exceed 20c. per 100 lb., with terms 30 days net or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 50, 10 and 5 per cent; small, cut thread, 50 and 5; large, 40 and 5.

Machine bolts, h.p. nuts, small, rolled thread, 50, 10 and 10 per cent; small, cut thread, 50 and 10; large, 40, 10 and 5.

Machine bolts, c.p.c. and t. nuts, small, 50 per cent; large, 35 and 10.

Blank bolts, 40, 10 and 5 per cent; bolt ends, with h.p. nuts, 40, 10 and 5 per cent; with c.p. nuts, 35 and 10. Rough stud bolts, 20. Lag screws (cone or gimlet point), 60.

Forged set screws and tap bolts, 15 per cent. Cut and round point set screws, case hardened, 60. Square and hexagon head cap screws, 55. Flat, button, round or fillister head cap screws, 35.

Nuts, h.p. sq., tapped or blank, $2.90 off list; hex., $2.90 off; c.p.c. and t. sq., tapped or blank, $2.60 off; hex., $3 off; semi-finished hex., 60 and 10 per cent; finished and case hardened, 60 and 10.

Rivets, 7/16 in. in diameter and smaller, 45, 10 and 10 per cent.

Rivets.—Practically all makers have their output sold for the remainder of this year, and for this reason are not quoting on domestic or export inquiries that are coming up nearly every day. One local maker will complete this week a shipment of seven carloads to India. Deliveries of steel from the mills are only slightly better. One local maker of rivets that was figuring on an inquiry tried to buy some heavy steel bars in the open market, and the best delivery he was promised was March, 1917. Prices are very strongly held and likely to be higher. For immediate shipment and on contracts up to and including Sept. 30, 1916, structural rivets are quoted at $3.75 and boiler rivets at $3.85 per 100 lb.

base; for fourth quarter of 1916, structural rivets are quoted at $4 and boiler rivets at $4.10 per 100 lb., base, f.o.b. Pittsburgh, terms 30 days net, or one-half of 1 per cent for cash in 10 days.

Railroad Spikes. — More new inquiry has come in the market, the New York Central asking prices on an indefinite quantity, supposed to be 30,000 kegs, also the Nickel Plate for a smaller amount and several of the Southern roads, all these being for 1917 delivery. However, few new contracts are being closed, the railroads balking at the high prices asked. We quote:

Standard railroad spikes, 4½ x 9/16 in. and larger, $2.65 to $2.75; railroad spikes, ½ and 7/16 in., $2.75 base; railroad spikes, ⅜ in. and 5/16 in., $3.05 base; boat spikes, $2.80 base, all per 100 lb., f.o.b. Pittsburgh.

Wire Products.—The demand for wire and wire nails is heavy, with the exception of barb wire, and in the past week or two this has increased. The American Steel & Wire Company reports a gain in new orders for barb wire in the past week, contracts running to about 75 per cent of normal. Export shipments of wire rods and wire are heavy, and large export contracts are pending. One leading maker of wire and wire nails is practically out of the market, but where a customer insists on placing a contract it is taken at $2.70 for wire nails for delivery in last quarter. Some orders for wire nails are being booked at $2.60. Regular prices in effect from May 1 are as follows: Wire nails, $2.50 to $2.60 per keg; galvanized, 1 in. and longer, taking an advance over this price of $2, and shorter than 1 in., $2.50. Plain annealed wire, $2.45 per 100 lb.; galvanized wire, $3.15; galvanized barb wire and fence staples, $3.35; painted barb wire, $2.65; polished fence staples, $2.65; cement coated nails, $2.50, base, all f.o.b. Pittsburgh, with freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven wire fencing are now 61½ per cent off list for carload lots; 60½ per cent for 1000-rod lots and 59½ per cent for small lots, f.o.b. Pittsburgh.

Shafting.—Makers are practically sold up for the remainder of this year, and on any odd lots for fairly prompt shipment buyers have to pay close to the base price. Specifications for shafting from automobile makers and the screw stock machine trade are heavy, and all the makers are back in deliveries 10 to 12 weeks or longer. We quote cold-rolled shafting at 15 per cent off in carload lots for delivery in third and fourth quarters, and 10 per cent off in less than carload lots, f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars.—It is said that two large contracts for steel rounds have been placed with local makers for delivery in first quarter of 1917. One mill that makes a full line of steel bars is reported sold up to April 1 next year, and is not quoting on new inquiries. Specifications for steel bars from the implement trade are coming in freely. All the mills are back in deliveries from three to four months, and none of them is catching up on shipments to any extent. The demand for iron bars is also heavy, and mills are back in deliveries. We quote steel bars at 2.75c. to 2.90c. for delivery at convenience of the mill, which would not be before last quarter. Small lots for fairly prompt shipment bring as high as 3.25c. at mill. We quote refined iron bars at 2.60c. to 2.75c.; railroad test bars, 2.70c. to 2.80c. at mill. These prices are for delivery at convenience of the mill, and for fairly prompt shipment premiums would be paid.

Hoops and Bands.—The mills are filled up for practically the remainder of the year, and on new orders are quoting about 3c. on both hoops and bands for indefinite delivery. The new hoop and band mill being built by the Phillips Sheet & Tin Plate Company at Weirton, W. Va., which was scheduled to start about July 1, will not be ready until a later date, delays being caused by strikes among concerns that are furnishing equipment. We quote hoops and bands at 2.75c. to 3c. at mill, prices depending on the deliveries wanted.

Merchant Steel.—Prices are purely nominal, as the mills are sold up through the third quarter, and one or two mills have little material to offer in fourth quarter. All the mills are far back in deliveries. On small lots for delivery at convenience of the mill, which would be in four or five months or longer, prices are about as follows: Iron-finished tire, ½ x 1½ in. and larger, 2.35c., base; under ½ x 1½ in., 2.50c.; planished tire, 2.55c.; channel tire, ¾ to ⅞ and 1 in., 2.85c. to 2.95c.; 1⅛ in. and larger, 3.25c.; toe calk, 2.95c. to 3.05c., base; flat sleigh shoe, 2.70c.; concave and convex, 2.75c.; cutter shoe, tapered or bent, 3.25c. to 3.35c.; spring steel, 2.95c. to 3.05c.; machinery steel, smooth finish, 2.75c.

Cotton Ties.—The Carnegie Steel Company is rolling cotton ties at its Painter and McCutcheon mills in this city, and also in two mills in Youngstown, and several other makers are also rolling a limited amount of cotton ties as they can spare the steel. However, nothing has been done as yet toward fixing the price for this year.

Wrought Pipe.—Some fairly heavy inquiries for oil and gas lines are in the market, mostly for Oklahoma and Texas, but some mills are not quoting on these, their orders already booked being so heavy they cannot get out the material or make the deliveries. On merchant pipe, none of the mills can promise shipment for two months or longer. All the mills are running to full capacity, and the output is much heavier than ever before. Discounts on black and galvanized iron and steel pipe, as given on another page, are firmly held.

Boiler Tubes.—While most large consumers are covered on their needs for the remainder of this year, there is still a fairly heavy new demand, but none of the mills making iron or steel merchant and boiler tubes can promise deliveries before the last quarter. Two of the large makers say they are practically sold up for all of this year, and on seamless steel tubing into the first quarter of 1917. Prices on both iron and steel tubes may be advanced in the near future. Discounts now in effect are given on another page.

Old Material.—Local dealers have made no important sales for several weeks. They are making no special effort to sell material under present conditions, and consumers are not interested in prices. Heavy steel scrap has sold in small lots as low as $17, but if a consumer came in the market for a fairly large lot he would have to pay $17.50 or more. There is no demand for borings or turnings, and they are lower. Low phosphorus melting scrap is also dull. No large lots of scrap are pressing the market for sale, and prices are holding fairly steady but on steel-making scrap are lower. The embargo on scrap routed to the Cambria Steel Company has been lifted, but it is still on to the Allegheny Steel Company, Brackenridge, Pa. Dealers quote for delivery in the Pittsburgh and near-by districts that take the same rates of freight, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh, delivered	$17.00
No. 1 foundry cast	$16.25 to 16.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	17.50 to 17.75
Hydraulic compressed sheet scrap	15.50 to 15.75
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	13.75 to 14.00
Bundled sheet stamping scrap	13.00 to 13.25
No. 1 railroad malleable stock	15.50 to 16.00
Railroad grate bars	12.50 to 12.75
Low phosphorus melting stock	19.50 to 20.00
Iron car axles	26.50 to 27.00
Steel car axles	26.00 to 26.50
Locomotive axles, steel	29.00 to 29.50
No. 1 busheling scrap	15.50 to 15.75
Machine shop turnings	9.75 to 10.00
Old carwheels	15.00 to 15.25
Cast-iron borings	9.75 to 10.00
*Sheet bar crop ends	18.00
No. 1 railroad wrought scrap	19.50 to 20.00
Heavy steel axle turnings	13.50 to 13.75
Heavy breakable cast scrap	14.50 to 14.75

*Shipping point.

Coke.—The market is dull, there being no demand for prompt coke and nothing doing in contract coke. Producers are not willing to sell for second half at present prices, and consumers are not interested at prices quoted by the operators. There has been a material cut in the output, costs of making it have gone

up, and more or less shortage of labor is expected during the summer months. All this makes conditions that will rule in the last half of the year very uncertain. Best grades of furnace coke for spot shipment are held at about $2.25, with some brands offered as low as $2 per net ton at oven. On contracts for last half of the year $2.50 to $2.60 at oven is talked of, but producers say this is too low, while consumers will not pay any higher prices for the time being. We quote best grades of foundry coke for spot shipment at $2.75 to $3, and on contracts $3.25 to $3.50 per net ton at oven. The Connellsville *Courier* gives the output of coke in the Connellsville region for the week ended May 6 as 411,200 net tons, an increase over the previous week of 3900 tons.

William P. Cheney, for 14 years, and Thomas A. Wilson, for 18 years, connected with the Pittsburgh office of Rogers, Brown & Co., Cincinnati, Ohio, have been appointed resident managers of the Pittsburgh offices, Farmers Bank Building, succeeding James R. Darragh, who died in March, 1915.

The offices of the Mount Union Refractories Company and the Basic Refractories Corporation have been removed from 1403 Arrott Building to 1447 Oliver Building Pittsburgh. J. O. Heitsenrether is sales manager for both companies.

Chicago

CHICAGO, ILL., May 17, 1916.—(*By Wire.*)

While there is considerable business of various sorts under consideration, a large portion of it having to do with plates for foreign shipbuilding and steel for war purposes, the market now lacks almost entirely that stress of buying which earlier characterized the effort of consumers to secure materials. Buying for prompt shipment other than from store is much less than it was. The implement interests are inquiring concerning their needs for the first half of 1917, and the bridge shops have been endeavoring to bring about a closing of their contracts for fourth quarter and first quarter steel on the basis of 2.50c., Pittsburgh. The fabricators are somewhat concerned because of the curtailment of projects calling for structural steel, their business having been more pronouncedly affected than other. The several small lots of rails which have been bought following the advance in price do not completely represent the desires of the railroads, other large inquiries being noted, one of which is for 20,000 tons. The buying of spikes, bolts and tie-plates persists, even at the very high prices. The lowering price of spelter is broadening the market for galvanized sheets, and with more favorable prices buying has improved. Prices for black sheets are somewhat higher. The pig-iron market is decidedly quiet, and for old material prices are being steadily reduced without apparent increase in interest on the part of melters.

Pig Iron.—Sales in the last week have been few and, with the exception of one lot of 2000 tons of foundry iron for last half, the quantities that have been negotiated were small. There is likewise very little inquiry. Prices for the future apparently represent a variety of opinion. Southern furnaces are still asking a premium for first half delivery. Local Northern furnaces are quoting the same price for both last half and first half. Silvery irons are being offered in this market for first half delivery at $2 per ton below the price for this year. While there has been some delaying of shipments from furnace, occasioned by labor difficulties in the foundries, this has not yet taken on proportions such as to occasion concern. Prices have not changed from the quotations of a week ago, but the Southern market is now more nearly represented by the price of $15, Birmingham, rather than $15.50. Sales of charcoal iron in the immediate vicinity of Chicago are very moderate in quantity, though the furnaces appear able to steadily dispose of their make at favorable points of distribution. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b., furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$19.75
Lake Superior charcoal, No. 1	20.25
Lake Superior charcoal, No. 6 and Scotch	20.75
Northern coke foundry, No. 1	19.50
Northern coke foundry, No. 2	19.00
Northern coke foundry, No. 3	18.50
Southern coke, No. 1 f'dry and 1 soft	$19.50 to 20.00
Southern coke, No. 2 f'dry and 2 soft	19.00 to 19.50
Malleable Bessemer	19.50
Basic	19.00 to 19.50
Low phosphorus	34.00 to 36.00
Silvery, 8 per cent	31.50
Bessemer ferrosilicon, 10 per cent	35.50

(*By Mail*)

Rails and Track Supplies.—A few roads are desirous of securing additional rails and there were placed last week one lot of 4500 tons and another of 2000 tons at the recent advance. Further sales of tie-plates at $50 per ton are also noted to the amount of 4000 tons. While the buying of spikes and bolts has already run into large quantities, there is still much to be bought. We have revised our quotations as follows: Standard railroad spikes, 2.75c., base; track bolts with square nuts, 3.25c. to 3.50c., base, all in carload lots, Chicago; tie-plates, $50, f.o.b. mill, net ton; standard section, Bessemer rails, Chicago, 1.47½c., base; open hearth, 1.56½c.; light rails, 25 to 45 lb., 1.80c.; 16 to 20 lb., 1.85c.; 12 lb., 1.90c.; 8 lb., 1.95c.; angle bars, 2c., Chicago.

Structural Material.—The Wisconsin Bridge & Iron Company has secured the order for a bridge at Yankton, S. D., which will require 3000 tons. For two viaducts, each 900 ft. long, to be built in connection with the Union Station terminal at Chicago, tenders will shortly be asked. The same project is expected to occasion an inquiry for sheet piling for the improvement of the dock frontage which the railroads have on the Chicago River. The only other contracts for fabricated steel reported were 150 tons of I-beams for the Chicago Union Station Company and 230 tons for bridge work for the Chicago, Milwaukee & St. Paul Railroad. Except for the interest being shown by fabricators in the possibility of securing their fourth quarter and first quarter steel on contracts at 2.50c., Pittsburgh, there is practically no new demand for structural shapes. Shipments of material from mill are not all that could be desired, even on the basis of the tardy deliveries quoted, most of the mills running behind even those schedules while at the same time making new shipment records. We quote for Chicago delivery of structural steel from mill the nominal contract basis of 2.689c., Chicago.

We quote for Chicago delivery of structural steel from jobbers' stock 3.10c.

Plates.—Inquiry for plates includes substantial requirements of ship plates from abroad for forward delivery, as well as a considerable aggregate of prompt shipment material for miscellaneous domestic purposes. Recent quotations on some of this business show the market to be exceedingly firm, with a range of prices from 3.50c. to 4c., Pittsburgh, depending somewhat upon the nature of the specifications. Sales of plates in recent weeks have again brought about the practical elimination of local mills from the market for early delivery business. We continue to quote for Chicago delivery of plates from mill, on contracts, the nominal price of 3.089c. and for prompt shipment 3.689c. to 4.189c.

We quote for Chicago delivery of plates out of jobbers' stock 3.50c.

Sheets.—A leading maker has advanced its price on black sheets to the basis of 3.15c., Pittsburgh, for No. 28. The general market, however, has not moved up to this level, it being possible still to secure prices of 3c. on open hearth and 2.85c. on Bessemer sheets. The declining price of spelter is introducing a little more latitude into the market for galvanized sheets and quotations on No. 28 have again gone as low as 4.85c., Pittsburgh. That there is a demand for galvanized sheets which is being held in check by small production and high prices is indicated by the prompt buying of such sheets when slight concessions are offered. We quote for Chicago delivery, blue annealed, No. 16 and heavier.

3.089c. to 3.189c.; box annealed, No. 17 and higher, 3.089c. to 3.189c.; No. 28 galvanized, 5.039c. to 5.089c.

We quote for Chicago delivery of sheets out of stock, minimum prices applying on bundles of 25 or more, as follows: No. 10 blue annealed, 3.40c.; No. 28 black, 3.10c. to 3.20c.; No. 28 galvanized, 5.40c. to 5.50c.

Bars.—Implement interests are beginning to show concern regarding their supply of steel bars for the first half. Within a period of 30 days it seems likely that contracting from January to July, 1917, will be well under way. Makers of bar iron have accumulated a very satisfactory backlog, and report that sales are sufficient to maintain their operations on a full schedule and under some pressure. The minimum quotation of 2.35c. continues to rule. The demand for high-carbon bars, while resulting in the placing of as much tonnage as the mills can comfortably roll, is not sufficient to bring the prompt shipment price up to the quotation for forward delivery, and most of the business is still being booked at 2.50c. We quote, mill shipment, Chicago, as follows: Bar iron, minimum, 2.35c.; soft steel bars, 2.689c. nominal on contracts, 3.18c. for prompt shipment; hard steel bars, 2.50c. to 2.75c.; shafting, in carloads, 20 per cent off; less than carloads, 15 per cent off.

We quote store prices for Chicago delivery: Soft steel bars, 3.10c.; bar iron, 3.10c.; reinforcing bars, 3.10c., base with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 10 per cent above list.

Rivets and Bolts.—Rivet makers in this market have not yet found it to their advantage to follow the full advance effective in other territory, and business continues to be placed at 3.50c. and 3.60c. in all quantities. Users of bolts and nuts who are not under necessity of buying for immediate needs are pressing manufacturers very strongly in their effort to avoid contracting on the basis of the last advance in prices. Except for urgent needs, very little business has been done at quotations last announced. We quote carriage bolts up to ⅝ x 6 in., rolled thread, 50-10-5; cut thread, 50-5; larger sizes, 40-5; machine bolts up to ⅝ x 4 in., rolled thread, with hot pressed square nuts, 50-10-10; cut thread, 50-10; larger sizes, 40-10-5; gimlet point coach screws, 60; hot pressed nuts, square, $2.90 off per 100 lb.; hexagon, $2.90 off. Structural rivets, ¾ to 1¼ in., 3.50c. to 3.75c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 3.50c.; boiler rivets, 3.60c.; machine bolts up to ⅝ x 4 in., 60-10; larger sizes, 50-10; carriage bolts up to ⅝ x 6 in., 60-5; larger sizes, 50 off; hot pressed nuts, square, $3.25, and hexagon, $3.25 off per 100 lb., lag screws, 65.

Wire Products.—The demand for wire nails shows no sign of decrease and the mills are falling farther behind, if anything, in their deliveries. A like situation obtains with respect to plain wire. For barb wire and fencing the demand is perceptibly less and conditions are decidedly easier. We quote as follows: Plain wire, No. 8 and coarser, base, $2.639; wire nails, $2.689; painted barb wire, $2.839; galvanized barb wire, $3.539; polished staples, $2.839; galvanized staples, $3.539, all Chicago.

Cast-Iron Pipe.—J. B. Clow & Son took the order for 500 tons of pipe at Elyria, Ohio; the American Cast Iron Pipe Company, 250 tons at Winterset, Kan., and the United States Cast Iron Pipe & Foundry Company, 300 tons of high-pressure pipe at Detroit, 300 tons at Middletown, Ohio, and 150 tons at Pueblo, Col. At Ironton, Ohio, 1150 tons is to be bought in the current week; at Akron, Ohio, 250 tons; at Wooster, Ohio, 275 tons, and at Denmark, Wis., 200 tons. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $33.50 to $34; 6 in. and larger, $30.50 to $31, with $1 extra for class A water pipe and gas pipe.

Old Material.—Weakness in prices becomes more pronounced as the apathetic disposition of consumers toward the market is prolonged. Even those grades of scrap which have displayed the greatest resistance to the downward trend of prices are being traded in at much lower figures, and specialties which have commanded exceptional values appear not to have escaped, notably steel car axles. Some trouble is being experienced at Chicago because of a laborers' strike at the scrap yards, but it is expected the trouble will not be of sufficient duration to affect the market, particularly in view of the amount of railroad and outside scrap to be had. This week's offerings of railroad scrap are, with the exception of a list of 15,000 tons from the Baltimore & Ohio, limited to 2000 tons from the Michigan Central and 1000 tons from the Chicago & Alton. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$18.00 to $18.50
Relaying rails	19.50 to 20.50
Old carwheels	13.00
Old steel rails, rerolling	17.50 to 18.00
Old steel rails, less than 3 ft	17.50 to 18.00
Heavy melting steel scrap	16.00 to 16.50
Frogs, switches and guards, cut apart	16.00 to 16.50
Shoveling steel	15.00 to 15.50
Steel axle turnings	10.75 to 11.00

Per Net Ton

Iron angles and splice bars	$18.50 to $19.00
Iron arch bars and transoms	19.75 to 20.25
Steel angle bars	15.00 to 15.50
Iron car axles	24.00 to 24.50
Steel car axles	25.50 to 26.00
No. 1 railroad wrought	16.25 to 16.75
No. 2 railroad wrought	15.00 to 15.50
Pipes and flues	12.00 to 12.50
No. 1 busheling	13.50 to 14.00
No. 2 busheling	9.50 to 10.00
Cut forge	15.00 to 15.50
Steel knuckles and couplers	15.50 to 16.00
Steel springs	16.00 to 16.50
No. 1 boilers, cut to sheets and rings	11.25 to 11.75
Boiler punchings	14.00 to 14.50
Locomotive tires, smooth	19.50 to 20.00
Machine shop turnings	7.00 to 7.25
Cast borings	6.50 to 7.00
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.25 to 10.75
Grate bars	10.75 to 11.00
Brake shoes	11.00 to 11.25
Railroad malleable	13.50 to 14.00
Agricultural malleable	11.25 to 11.75

Philadelphia

PHILADELPHIA, PA., May 16, 1916.

A development of the situation is the growing utilization of steel discarded in the manufacture of shells. It is being used for forgings, screw stock, cold-drawn work, etc., and has been found to twist cold with excellent results. Practically all of the mills rolling rounds are finding a ready market for this material. Structural shapes are becoming more than ever difficult to obtain because of the reduction of jobbers' stocks. The demand for plates continues to come along at a rapid pace, and there is increasing inquiry for third quarter delivery. In no direction is there any indication of recessions in prices, except in old material; on the contrary, premiums are willingly paid for prompt deliveries. Pig iron is dull, but the trade welcomes relief from the heavy demand of recent weeks. Old material continues to suffer from the embargoes and from a surplus of material on the market.

Pig Iron.—Both inquiries and sales are at best moderate in volume, but the quiet trend is a relief to producers and sellers alike and not a cause for dissatisfaction. It is recognized as natural that dullness should follow the big buying of a few weeks ago. How heavy this buying was is indicated by the fact, that had it continued at full tilt at the rate which prevailed in March, one important seller would now have his product engaged for two years. As it is, he is a little apprehensive as to how he will meet the requirements of some of his customers in the latter part of this year. Another seller in the first quarter of this year booked double the business he did in the corresponding period of last year. In steel-making iron there has been less activity than in foundry grades, no business whatever being reported in basic. Quotations show no change. Lebanon low phosphorus is quoted at $30 to $32, furnace. Quotations for standard brands, delivered in buyers' yards, prompt shipment, range about as follows:

Eastern Pa., No. 2 X foundry	$20.50 to $21.00
Eastern Pa., No. 2 plain	20.25 to 20.75
Virginia, No. 2 X foundry	21.25
Virginia, No. 2 plain	20.75
Gray forge	19.50
Basic	20.50 to 21.00
Standard low phosphorus	34.00 to 35.00

Ferroalloys.—Interest in the ferromanganese situation seems to have subsided to a considerable extent, and spot is easier. In well-informed quarters it is said

that $300, seaboard, probably would be accepted for prompt 80 per cent material. It develops that about 26 tons, which was held a few weeks ago at over $400, finally was taken by a dealer on behalf of a Chester steel foundry at $400. The quotation for last quarter continues at $200, seaboard, and that for first half at $175. Contract 50 per cent ferrosilicon is unchanged at $83 to $85, Pittsburgh.

Iron Ore.—Arrivals at this port in the week ended May 13 consisted of 12,600 tons from Cuba, 12,303 tons from Spain and 9600 tons from Sweden.

Plates.—The mills are getting inquiry in increasing volume for third quarter, and in some cases are quoting 4.159c., Philadelphia, for that delivery. Orders continue to come along steadily. The call for plates is stronger from the locomotive builders; also from the bridge and structural fabricators. In cases where odds and ends can be delivered promptly, up to 5.50c., Eastern mill, has been paid by consumers.

Rails.—Some inquiry for delivery next summer is coming out, and if they are bona fide and not issued merely to test the new prices, present indications point to the placing of between 35,000 and 40,000 tons.

Bars.—The steel-bar situation is practically unchanged, regular stock still being difficult to find and held at a premium. Some little relief may be forthcoming from expected offerings of bars rolled from discarded shell steel. The nominal quotation is 2.909c., Philadelphia. Iron bars are strong at 2.659c., Philadelphia, in carload lots.

Structural Material.—Contracts have not yet been placed for the material required for the extensions to be made at the plants of the Worth Brothers Company, Coatesville, Pa., and the Midvale Steel Company, Nicetown, Philadelphia, both subsidiaries of the Midvale Steel & Ordnance Company. The Coatesville proposition involves 1500 to 2000 tons. That at Nicetown was to have required about 3500 tons, but the plans have been changed to provide for a one-story building, 210 x 500 ft., instead of a three-story structure, 80 x 500 ft., and as a result the amount of steel needed will be cut in half. The Carpenter Steel Company, Reading, Pa., has a proposition pending for about 450 tons of shapes for an extension to its plant. Warehouse stocks are low, and consumers are finding greater difficulty in securing material. The minimum quotation is unchanged at 3.159c., Philadelphia, and on this basis business is being done into the third quarter.

Billets.—Open-hearth rerolling billets are quoted at $50 to $55, and forging steel at $65 to $70. There is no lessening of consumption. New uses to which discarded shell-round steel can be put are rapidly being found. Aside from forging work, it is being used for screw stock, shafting, spikes, cold drawn work, etc. It has been twisted cold with excellent results. The prices obtained vary with the sizes furnished and the purposes for which the steel is to be used.

Sheets.—Quotations for No. 10 blue annealed sheets are unchanged at 3.909c. to 4.159c., Philadelphia.

Old Material.—The market continues to drag and several items in the list are lower. Business is hampered as much as ever by freight embargoes, Conshohocken now being among the places under the ban for the reason that scrap material was being delivered faster than it could be unloaded. There is an abundance of material on the market. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania, and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$16.50 to $17.00
Old steel rails, rerolling	19.00 to 20.00
Low phos. heavy melting steel scrap	22.50 to 23.25
Old steel axles	26.00 to 27.00
Old iron axles	28.00 to 29.00
Old iron rails	20.00 to 20.50
Old carwheels	16.50 to 17.00
No. 1 railroad wrought	22.50 to 23.00
Wrought-iron pipe	14.00 to 14.50
No. 1 forge fire	14.50 to 15.00
Bundled sheets	14.50 to 15.00
No. 2 busheling	11.00 to 11.50
Machine shop turnings	9.00 to 9.50
Cast borings	10.00 to 10.50
No. 1 cast	17.50 to 18.00
Grate bars, railroad	13.50 to 14.00
Stove plate	13.00 to 13.50
Railroad malleable	14.50 to 15.00

Coke.—But little activity is reported. Prompt furnace is quoted from $2.25 to $2.50 per net ton at oven, and contract furnace at $2.50 to $2.75. Prompt foundry ranges from $3.50 to $3.75 and contract $3.50 to $3.75. Prices are subject to almost daily changes. Freight rates from the principal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85; and Mountain, $1.65.

Cincinnati

CINCINNATI, OHIO, May 17, 1916.—(*By Wire.*)

Pig Iron.—An inquiry for 15,000 tons of basic is being figured on locally for delivery to a St. Louis plant the last quarter of this year and in first quarter of next. Northern basic is asked for but it is understood that Southern producers will compete for the business. Foundry iron is quiet, and order books last week only recorded limited tonnages that were sold principally through the direct solicitation of traveling salesmen. A few nearby consumers have bought quantities ranging from 100 to 500 tons of Southern iron, with shipments about equally divided between the last half of this year and the first half of 1917. One sale of 500 tons of Southern No. 4 for last half delivery was made to a central Ohio firm at $14.75, Birmingham basis, but it is understood that this was special iron and brought a premium. About 300 tons of Southern No. 2 foundry was taken at $15.50 by a southern Ohio melter for last half shipment, with deliveries extended into next year. Southern prices are not strong, and $15 for shipment through the year can be done, although the asking price by the furnaces is 50c. higher. A number of carloads of resale iron that had to be moved promptly have lately been sold at 25c. to 50c. per ton below the regular market quotations. There also seems to be a tendency on the part of the Southern furnaces to take on some backlog business for shipment in the first half of next year at a small advance over the present prompt shipment price. Resale Northern iron at $18.50 for this year's delivery is becoming scarce, and $19, Ironton, is the furnace quotation for 1916, and first half orders for 1917 are acceptable at the same figure. A central Ohio consumer, whose inquiry for 1200 tons of mixed Northern and Southern grades has been pending for 10 days, closed this week. There is also some business in sight in southern Illinois for Southern foundry iron. Quotations on the silvery irons are not uniform, and it is stated that Southern competition is a factor that has influenced the market to a certain degree. The majority of the Ohio furnaces are holding at $29 at furnace based on an 8-per cent analysis, but $27 can still be done. The only purchase of consequence reported was by an Indiana company of 400 tons for last half shipment. Southern carwheel iron is more active. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$18.40 to $18.90
Southern coke, No. 2 f'dry and 2 soft.	17.90 to 18.40
Southern coke, No. 3 foundry	17.40 to 17.90
Southern coke, No. 4 foundry	16.90 to 17.40
Southern gray forge	16.40 to 16.90
Ohio silvery, 8 per cent silicon	28.26 to 28.76
Southern Ohio coke, No. 1	21.26
Southern Ohio coke, No. 2	20.26
Southern Ohio coke, No. 3	19.76
Southern Ohio malleable Bessemer	20.26
Basic, Northern	20.26
Lake Superior charcoal	21.20 to 22.20
Standard Southern carwheel	24.90 to 25.40

(*By Mail*)

Finished Material.—There is still a call from the outside on local warehouses for rounds, including cold-rolled shafting. The local store quotation on cold-rolled shafting is 20 per cent plus the list price. The mill price of sheets is unchanged at 5.15c. for No. 28 galvanized sheets, Cincinnati or Newport, Ky., and from 3.15c. to 3.20c. for No. 28 black. Jobbers state that the wire nail business is improving somewhat in spite of their advance to $2.75 per keg, base. Barb wire is quoted at $3.60 per 100 lb. Mill agencies report a slackening in inquiries for different kinds of structural material, which they attribute to the high prices prevailing

and in many cases to the inability of the mills to make prompt shipment. This does not apply especially to reinforcing concrete bars, as concrete construction is rapidly forging to the front in this part of the country. We quote No. 10 blue annealed sheets from jobbers' stocks at 3.50c.; plates, 3.50c.; small structural shapes, 3.20c. The hoop and band business is normally fair.

Coke.—Furnace coke contracting in this territory is at a standstill, as practically all consumers have covered for future requirements. Foundry buying is also slow for either prompt or future, although a few carload quantities have been taken to fill in. Prices are unchanged, Connellsville furnace coke being held at $2.25 to $2.50 per net ton at oven, although a few producers are asking 25c. to 50c. a ton higher on long-time contracts. Wise County and Pocahontas furnace cokes are quoted around $2.40 to $2.75. Foundry coke in all three districts named is held around $3.50 to $3.75 at oven, with New River coke quoted at $4 to $4.25.

Old Material.—Very little business is reported and prices are soft. Only a comparatively few grades of scrap material are in demand. The inbound shipments are said to be ahead of the outbound. The following are dealers' prices to consumers f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$11.75 to $12.25
Old iron rails	15.75 to 16.25
Relaying rails, 50 lb. and up	21.25 to 21.75
Rerolling steel rails	15.00 to 15.50
Heavy melting steel scrap	14.25 to 14.75
Steel rails for melting	13.50 to 14.00

Per Net Ton

No. 1 railroad wrought	$13.50 to $14.00
Cast borings	5.50 to 6.00
Steel turnings	5.50 to 6.00
Railroad cast scrap	11.25 to 11.75
No. 1 machinery scrap	13.00 to 13.50
Burnt scrap	8.25 to 8.75
Iron axles	20.25 to 20.75
Locomotive tires (smooth inside)	18.00 to 18.50
Pipes and flues	9.75 to 10.25
Malleable and steel scrap	11.00 to 11.50
Railroad tank and sheet scrap	8.75 to 9.25

Buffalo

BUFFALO, N. Y., May 16, 1916.

Pig Iron.—Conservatism in buying appears to be the feature at present and the aggregate of sales for the week is very small. A fair number of inquiries have been before the market for extended deliveries and over first half of next year, but buyers are holding off and furnacemen are taking no active steps to secure the business. The price range covering low and high grades of foundry iron, No. 4 to No. 1, now appears to be $18.50 to $19.50, at furnace, although $19 to $19.50 for low silicon and $20 for 2.50 to 3 per cent silicon is asked by some furnaces for last quarter and deliveries extending into first half of 1917. Eastern shipments will now go forward via Erie Canal. We quote as follows, f.o.b. furnace, Buffalo, for current and last half delivery:

No. 1 foundry	$19.50 to $20.00
No. 2 X foundry	19.00 to 19.50
No. 2 plain	18.75 to 19.00
No. 3 foundry	18.75 to 19.00
Gray forge	18.50 to 19.00
Malleable	19.00 to 20.00
Basic	19.50 to 20.00
Bessemer	21.00 to 22.00

Finished Iron and Steel.—Users of bars, shapes and plates are placing specifications as far ahead as mill conditions will permit. Contracts will soon be let for 600 tons of reinforcing bars for warehouse for the Schoellkopf Aniline Chemical Works, this city. The Ferguson Steel & Iron Company, Buffalo, will furnish 2500 tons of structural steel for the same plant.

Old Material.—Inquiry has fallen off to some extent in a number of the principal lines, although a fair total of transactions is reported. Heavy melting steel has dropped 50c. per ton and users are becoming more rigid in inspection of material furnished on contracts for this commodity, resulting in an unusually heavy percentage of rejections. Demand is light for borings and turnings and for busheling scrap, and prices for these commodities have weakened slightly. Prices are also somewhat softer in some other lines. We quote dealers' asking prices, per gross ton, f.o.b., Buffalo, as follows:

Heavy melting steel	$17.00
Low phosphorus steel	$20.00 to 20.50
No. 1 railroad wrought scrap	19.00 to 19.50
No. 1 railroad and machinery cast scrap	16.00 to 16.50
Old steel axles	24.00 to 24.50
Old iron axles	24.00 to 24.50
Old carwheels	14.50 to 15.00
Railroad malleable	15.50 to 16.00
Machine shop turnings	8.00
Heavy axle turnings	12.00
Clean cast borings	9.25 to 9.50
Old iron rails	18.00 to 18.50
Locomotive grate bars	12.00 to 12.50
Stove plate (net ton)	11.50 to 12.00
Wrought pipe	14.00 to 14.50
Bundled sheet scrap	12.50 to 13.00
No. 1 busheling	14.50
No. 2 busheling	11.50
Bundled tin scrap	15.00 to 15.50

Cleveland

CLEVELAND, OHIO, May 16, 1916.

Iron Ore.—Operations in Lake Superior mining districts are proceeding quite satisfactorily, and a heavy volume of ore is being shipped. Production is at the maximum capacity and the supply of labor is adequate, although there is some complaint of the quality of labor at the open pit mines. That consumers are well covered is indicated by the fact that there is practically no inquiry for ore. We quote as follows, delivered lower Lake ports: Old range Bessemer, $4.45; Mesaba Bessemer, $4.20; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.55.

Pig Iron.—The market is unusually dull. A few foundries have not yet covered for their third and fourth quarter requirements, and some small lot orders are being placed for those deliveries. There is little inquiry for iron for next year. Some of the furnaces are taking on business for the first half at somewhat less than last half prices, but they are not urging 1917 contracts, and the foundries interested in buying that far ahead are chiefly those having long time contracts for automobile castings. Local prices are unchanged at $18.50 to $19 for No. 2 for out of town shipments and $19 at furnace for Cleveland delivery. A few sales of Southern iron are reported at $15.50, Birmingham, for No. 2 for last half and fourth quarter. This quotation is being made for the first half of next year, but no sales are reported for that delivery. For early shipment Southern iron is still quoted at $15, Birmingham. Ohio silvery iron is quiet, but the demand on contracts is heavy and furnaces are behind on shipments. The local situation is affected somewhat by strikes in two foundries and the possibility that the present labor troubles will spread to other shops. Corrigan, McKinney & Co. are operating their new No. 3 furnace which was blown in last week on foundry iron. Their two old Cleveland stacks furnish metal for their steel plant. We quote, delivered Cleveland, as follows:

Bessemer	$21.95 to $22.45
Basic	19.00 to 19.30
Northern No. 2 foundry	19.30 to 19.80
Southern No. 2 foundry	19.00 to 19.50
Gray forge	18.75
Jackson Co. silvery, 8 per cent silicon	30.62
Standard low phos., Valley furnace	32.00

Coke.—Complaints about shipments have disappeared and foundries are now getting a good supply of coke on contracts. There is practically no new demand. Standard Connellsville foundry coke is quoted at $3.75 to $3.50 for prompt shipment and $3.50 to $3.75 for contracts.

Finished Iron and Steel.—New demand for steel for early delivery has eased up considerably. However, there is a fair volume of inquiry for third and fourth quarter contracts which most mills are unable to take on. Some of the mills that have been asking high prices for steel bars for early shipments are making somewhat lower quotations. Steel bars are being offered at 3c. for fairly prompt shipment, and a price of 2.50c. is reported for delivery at the convenience of the mills. Plates are firm at 3.50c. to 4c. and higher for early shipment. The demand for structural shapes has fallen off materially, owing to many building projects being deferred because of the high cost of steel, and several Ohio fabricators who over-bought on

an advancing market are offering structural steel for sale from their stocks at around 3c. Other fabricators are trading material rather than to pay the mill price. The contract for the Bond Hotel, Toledo, for which the steel was placed some time ago, has been awarded to the Toledo Bridge & Crane Company. This will require 5500 tons, mostly Bethlehem sections. A local mill reports sales of open-hearth billets at $46. Hard steel bars are in fair demand and are selling in this market at 2.25c., Moline, Ill., for early shipment. The demand for heavy gages of black sheets is very good and prices on these gages are firmer, but there is a weakness in light gages. Some of the mills desiring to close out their stocks of light gages are offering these at price concessions down to 2.85c. and 2.90c. at mill. We quote sheets at 2.85c. to 3.05c. for No. 28 black, 3c. to 3.25c. for No. 10 blue annealed and 4.90c. to 5.10c. for No. 28 galvanized. Iron bars are unchanged at 2.50c., Pittsburgh. Warehouse business has fallen off considerably, owing to the depletion of stocks. We quote warehouse prices at 3.25c. for steel bars and structural material, 3.65c. for plates and 3.20c. for iron bars.

Bolts, Nuts and Rivets.—Railroads and implement manufacturers have come into the market for bolt and nut contracts for the last half during the past few days, and a large volume of business has been closed with these consumers at quoted prices. Rivets continue in good demand, with prices unchanged at 3.75c., Pittsburgh, for structural and 3.85c. for boiler rivets for carload lots for third-quarter delivery, with an advance of $5 per ton for fourth quarter. Bolt and nut discounts are as follows:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 50, 10 and 5; cut thread, 50 and 5; larger or longer, 40 and 5; machine bolts with h. p. nuts, ⅝ x 4 in., smaller and shorter, rolled thread, 50, 10 and 10; cut thread, 50 and 10; larger and longer, 40, 10 and 5; lag bolts, gimlet or cone point, 60; square h. p. nuts, blank or tapped, $2.90 off the list; hexagon, h. p. nuts, blank or tapped, $2.90 off; c. p. c. and t. square nuts, blank or tapped, $2.60; hexagon nuts, all sizes, $3 off; cold pressed semi-finished hexagon nuts, all sizes, 60 and 10.

Old Material.—The market continues dull and weak. Prices, after a gradual decline over a period of several weeks, appear about stationary, although heavy melting steel is about 25c. a ton lower. A local mill has taken on a fair tonnage of heavy melting steel at $16, but mills generally are well supplied for some time ahead, and do not want to buy at present prices. Scrap is being shipped to the mils faster than wanted. The embargo at the Upson plant continues, and Corrigan, McKinney & Co. are holding back on shipments. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Old steel rails	$16.00 to $16.25
Old iron rails	19.00
Steel car axles	28.00 to 29.00
Heavy melting steel	16.00 to 16.25
Old carwheels	13.50 to 13.75
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	14.00 to 14.25
Railroad malleable	17.00 to 17.25
Steel axle turnings	13.00 to 13.25
Light bundled sheet scrap	13.00 to 13.25

Per Net Ton

Iron car axles	$23.00 to $24.00
Cast borings	7.50
Iron and steel turnings and drillings	7.50
No. 1 busheling	14.00 to 14.25
No. 1 railroad wrought	17.00 to 17.50
No. 1 cast	14.00 to 14.25
Railroad grate bars	11.75 to 12.00
Stove plate	11.25 to 11.50

St. Louis

ST. LOUIS, MO., May 15, 1916.

Pig Iron.—Buying has been quiet, consisting of small lots and largely for immediate delivery. Prices are stiffly held. Practically no sellers have opened their books for 1917 and most are sold up for 1916. A stove company has bought, for 1917 delivery, 2000 tons of No. 2 and No. 3 Southern foundry iron.

Coke.—An inquiry for 10,000 tons of by-product coke for delivery over the last half of 1916 and the first half of 1917 is the only feature, inquiries being few and sales of small lots only. Prices remain as of the Connellsville and Virginia oven quotations on both foundry and furnace cokes, with local by-product coke held at a parity.

Finished Iron and Steel.—The market is dull because books have not been opened for 1917 delivery and there is no possibility of getting anything in 1916. Specifications are good and in some cases have anticipated the allotments. Track fastenings are very active and the demand is even beyond allotments. Movement out of warehouse is very heavy, with the prices for warehouse stock as follows: Soft steel bars, 3.15c.; iron bars, 3.10c.; structural material, 3.15c.; tank plate, 3.55c.; No. 10 blue annealed sheets, 3.45c.; No. 28 black sheets, cold-rolled, one pass, 3.30c.; No. 28 galvanized sheets, black sheet gage, 5.55c.

Old Material.—The scrap market is at sixes and sevens, largely because consuming plants are running on their yard supplies, which are large, and refusing to buy, besides maintaining an embargo on material previously bought and not yet delivered. At the same time the plants are running full, and therefore can scarcely go more than 30 days or so longer without re-entering the market. Dealers believe that the mills have decided upon a waiting game in order to reduce prices to a lower level before re-entering the market. This they can very well do with the tonnages they have on hand. Moreover, inventory time is coming, with the natural tendency to get the yard stocks into a clean condition. No lists appeared during the week and dealers are buying as little as they can. Relayers are still in very active demand. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$17.00 to $17.50
Old steel rails, re-rolling	16.00 to 16.50
Old steel rails, less than 3 ft	16.50 to 17.00
Relaying rails, standard section, subject to inspection	22.00 to 23.00
Old carwheels	12.00 to 12.50
No. 1 railroad heavy melting steel scrap	15.50 to 15.75
Heavy shoveling steel	12.75 to 13.25
Frogs, switches and guards cut apart	15.00 to 15.50
Bundled sheet scrap	10.00 to 10.50

Per Net Ton

Iron angle bars	$16.00 to $16.50
Steel angle bars	13.50 to 14.00
Iron car axles	23.50 to 24.00
Steel car axles	25.00 to 25.50
Wrought arch bars and transoms	19.25 to 19.75
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	15.25 to 15.75
Railroad springs	14.00 to 14.50
Steel couplers and knuckles	14.00 to 14.50
Locomotive tires, 42 in. and over, smooth inside	19.00 to 19.50
No. 1 dealers' forge	10.50 to 11.00
Cast borings	6.50 to 7.00
No. 1 busheling	13.00 to 13.50
No. 1 boilers, cut to sheets and rings	9.25 to 9.75
No. 1 railroad cast scrap	12.00 to 12.50
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	11.25 to 11.75
Agricultural malleable	10.25 to 10.75
Pipes and flues	10.50 to 11.00
Railroad sheet and tank scrap	9.75 to 10.25
Railroad grate bars	9.00 to 9.50
Machine shop turnings	7.50 to 7.75

San Francisco

SAN FRANCISCO, CAL., May 9, 1916.

General buying is on hardly as large a scale as a few weeks ago. Demand for prompt delivery in most lines still exceeds the supply, and considerable premium business is done to meet urgent requirements; but there is less disposition to buy for delivery at the convenience of the mills, and contracting for extended periods has been greatly curtailed. Much of the business under way is of an extraordinary nature, and there is abundant evidence that high prices, and to some extent slow deliveries, are interfering with normal consuming demands. Foreign inquiry continues active, but the situation is not conducive to the placing of much tonnage.

Bars.—Notwithstanding a reduction of orders from many of the usual sources, the movement continues comparatively heavy. Local mills have about completed deliveries on old export contracts, but are getting local business to take their output several months in the future. Large consumers are buying freely from store, and specifications on contracts continue heavy. Demand for concrete bars is strong, with enough emer-

gency work to make up for the delay in speculative building. Small lots from store are still quoted at 4c.

Structural Material.—There is plenty of figuring, but the contracts closed are hardly in line with the number of inquiries, many builders being evidently scared out of the market by high prices and slow deliveries. Some apartment buildings are being placed, however, as well as a considerable number of industrial buildings and bridges. Deliveries to fabricators on old contracts have been fairly heavy, but work is hampered by lack of assortments. Demand for marine and miscellaneous work is strong. A local mill is expected to start rolling a fair assortment of shapes early in the third quarter.

Plates.—Ship construction contracts continue to absorb practically all the plates of suitable sizes that can be had, either for direct shipment or from store, and many mills are refusing new business except from their regular trade. Specifications are also heavy from pipe and tank manufacturers. Small business in general is rather less urgent, but the tonnage is still large.

Sheets.—While the demand in many quarters is closely limited by the present prices, the movement is not greatly below normal, and some difficulty is experienced in taking care of the business offered. The buying of blue annealed continues heavy, and the demand for prompt delivery from store keeps jobbing stocks in a rather depleted condition. Inquiries for special pipe and tank work are numerous, and manufacturing requirements have recently increased in several quarters. Black sheets are quiet. The city of Los Angeles is taking bids for 17,860 ft. of 6-in. riveted pipe.

Wrought Pipe.—Plumbing sizes are in slightly more demand, but tend to lag behind the general market, and are coming through in good time. Business in lap-weld pipe is exceptionally active, and in many cases mills are declining new business, on which they could not make deliveries before next spring, with a resulting increase in sales from store. Resale prices are fully keeping pace with the advances in mill values. Oil interests are the largest buyers, as oil production continues below the demand and new drilling is more active than for several years. Sales of second-hand pipe from the Exposition are a factor of importance in the market, but under the conditions their effect is not serious.

Cast-Iron Pipe.—Inquiries of individual importance are still lacking, but small orders are very numerous and well distributed, keeping the volume fully normal. A considerable quantity of gas pipe is included in the current business. Prices show no further change.

Pig Iron.—A shipment of Hanyang iron arrived recently, including 363 tons of basic and 450 tons of No. 1 foundry. Foundry operations are exceptionally active, and, while arrivals on contracts are large, there is very little accumulation. Many melters are still placing contracts for delivery through the second half. Southern foundry iron is quoted here at $26.50 to $27 per gross ton for No. 1 and $26 for No. 2. Melters are also using considerable special high-manganese iron for which $30 or more is paid.

Coke.—Arrivals on contracts continue heavy, but new orders for either prompt or extended delivery are appearing rather slowly. Southern foundry coke is quoted here at about $16 per net ton.

Old Material.—Steel melting scrap remains at the former general range of $8 to $13 per gross ton, the latter price being asked by dealers for the most desirable offerings, though the quantity moved at that figure is limited. The demand is quite active, and many accumulations are being cleaned up, though the available supply is still large. Cast-iron scrap is very firm, as melters have been buying liberally of late, and stocks of desirable scrap are running low. Dealers are asking about $20 per net ton for carwheels and similar desirable scrap, and general offerings are held at $16 to $18.

Ferroalloys.—The situation is a little easier in both ferromanganese and ferrosilicon. A limited amount of the former is coming in on old contracts, and deliveries from foreign sources will be available after September at prices that are still rather uncertain, but are pretty sure to be below the recent level. Ferrosilicon also is coming in more freely, and supplies appear to be adequate for immediate needs.

The Noble Electric Steel Company's furnace at Heroult, Cal., has been running steadily for the past week with a daily output of 12 tons of ferromanganese. An ample supply of ore is coming from several mines and another furnace is about ready to start.

A Foundry Foremen's Club has been organized in San Francisco, meeting twice a month. John E. Cope, Western Foundry Company, is president.

Birmingham

BIRMINGHAM, ALA., May 15, 1916.

Pig Iron.—The market is quieter than it has been in several months. It is accepted in this district that Tennessee pig iron and that from the extreme northern Alabama district may be selling at as much as 50c. per ton under Birmingham iron, especially via the Tennessee and Ohio rivers by barges to St. Louis, Chicago and Northwestern territory, a mode of transportation that puts those irons $1 per ton delivered under the Birmingham product, but Birmingham makers, being sold ahead for about four months of the last half, are not cutting. A small increase in stocks of free foundry iron during each of the past two months is noted, the first in a long time. Warrant stocks have a way of keeping in the neighborhood of 100,000 tons, with fully half the property of consumers. The leading interest adheres to the general scale of prices, and, like the other furnace companies, is taking on metal in small quantities from all points without any especially large deals reported. Firm offers of $15.50 for the first quarter of 1917 would be favorably considered by several makers. Basic seems firmer than foundry and is bringing No. 2 foundry prices with ease on some additional orders. The idle Vanderbilt stack of the Woodward Company is billed to go in June 10 and the large Woodward stack to go on basic July 1 for the rest of the year. The Woodstock and the Gadsden stack of the Alabama Company will be later in coming in. We quote, per gross ton, f.o.b. Birmingham district, as follows:

No. 1 foundry and soft	$15.50 to $16.00
No. 2 foundry and soft	15.00 to 15.50
No. 3 foundry	14.50 to 15.00
No. 4 foundry	14.25 to 14.75
Gray forge	14.00 to 14.50
Basic	15.00 to 15.50
Charcoal	22.50 to 23.00

Cast-Iron Pipe.—The gas and water pipe orders of the past week have been scattered. Little business is coming from the East, but the Middle and Far West continue to buy regularly. The sanitary pipe shops report the cessation of labor troubles and a renewal of activity, with most shops fairly busy. Dealers are filling up for spring stock. Market quotations might be shaded for especially attractive specifications. We quote, per net ton, f.o.b. shop yards, as follows: 4-in., $29; 6-in. and upward, $26, with $1 added for gas pipe and 16-ft. lengths.

Coal and Coke.—Coal is looking up. Railroads are taking notably more and prices have steadied and somewhat improved. Special coals, such as blacksmithing, are bringing 50 to 60 per cent more than they did at this time in 1915. Coke is firm at $4.50 per net ton, f.o.b oven, for Brookwood and Yolande standard beehive foundry makes, with furnace coke at $3.20 to $3.40 and little to be had. Preferred customers might get some foundry at $4.25. The movement to Texas and the Pacific coast is the largest in a long time. Cars are loaded to capacity, thus relieving the shortage.

Old Material.—The scrap market has continued to soften, and dealers are exercising discrimination in their purchases. Steel scrap has joined in the decline. Dealers say the higher freight rates to the East have cut into business. Old steel axles are again reported around $20 to $21, f.o.b. Birmingham, with even higher prices when available for export. We quote, per gross

ton, f.o.b. Birmingham yards, dealers' prices to consumers, as follows:

Old steel axles	$21.50 to $22.00
Old steel rails	12.00 to 12.50
No. 1 steel scrap	10.75 to 11.25
No. 1 wrought scrap	14.50 to 15.00
No. 1 cast scrap	11.00 to 11.50
Extra heavy cast scrap	9.50 to 10.00
Stove plate and light	10.00 to 10.50
Tram carwheels	10.50 to 11.00

New York

NEW YORK, May 17, 1916.

Pig Iron.—The market continues quiet. The inquiry of a western New York malleable interest for 10,000 tons has resulted in the purchase of 5000 tons for delivery this year. It does not appear that the iron wanted for next year has yet been placed. The recently prevailing Buffalo price was shaded on this order. In the New York district there is an inquiry of 1000 tons for early delivery on the Jersey side and another New Jersey foundry is asking for 1000 to 2000 tons for prompt shipment. In Brooklyn several inquiries for a few hundred tons each have come up and one sale is reported in this district for delivery through all of next year. In the export market 500 tons of Southern iron is asked for and a sale of 1000 tons of Pennsylvania foundry iron to go abroad is reported. A New England company which covered for malleable pig iron recently is now asking for 1500 tons of foundry iron for last quarter and first half delivery. A large interest which buys basic in New York for St. Louis delivery is still in the market for 10,000 tons. As Alabama basic can be delivered at St. Louis at $18.40 based on $15, Birmingham, Southern iron, even though higher in phosphorus, is likely to be taken as against Chicago district iron at $19 at furnace with $1.50 freight. The New England embargo on the New Haven is again in force, but New England foundries are now quite well supplied and there will be no special hardship for the present. We quote at tidewater for early delivery: No. 1 foundry, $21 to $21.25; No. 2 X, $20.50 to $20.75; No. 2 plain, $20.25 to $20.50; Southern iron at tidewater, $20.75 to $21 for No. 1 and $20.25 to $20.50 for No. 2 foundry and No. 2 soft.

Ferroalloys.—The demand for both spot and contract ferromanganese is very light. Spot alloy has been offered at $400 but not sold on a bid of $360, while an offer for $400 for some British standard alloy due to arrive next week has been refused. A few small lots have been sold on contract for delivery in the first half of next year at $175, seaboard, the quotation for delivery in 1917, but there is no demand beyond the first half. Standard British alloy is still available for the last half and quarter of this year at $200 to $210, seaboard. Eastern Pennsylvania producers are selling at $210 for the last half. Spiegeleisen is quiet at $60 to $65, furnace, for this year's 20 per cent material, but this is probably a nominal price, as very little is unsold. The low percentage alloy being produced in the Chicago district is understood to be coming on the market. Sales to manganese alloy makers of a high percentage manganese slag as a means of enriching the ferroalloy made from lean ores is an interesting development. Ferrosilicon, 50 per cent, is very strong. A sale of 5000 tons to a foreign country, delivery to begin in September and to continue into 1917, is a significant indication in connection with peace talk. The quotation still remains at $83 to $85, Pittsburgh, with frequent sales of small lots at $90 to $100.

Structural Material.—Railroad lettings are still conspicuous, but there is a large aggregate in the structural work being taken for industrial plant extensions. With the urgency usual in the latter cases, high prices are of course paid for the plain material. The Pennsylvania has placed 13 bridges, taking 1800 tons, with the Phoenix Bridge Company and 18 bridges, requiring 2500 tons, with the Fort Pitt Bridge Works and is now in the market for 17 bridges totaling 800 tons. The Lehigh Valley, following 1500 tons given to the Pennsylvania Steel Company, has awarded 1600 tons to the Phoenix Bridge Company. The Western Maryland has let 1300 tons to the McClintic-Marshall Company. Two highway bridges at Bridgeport, Conn., calling for 800 tons, have been contracted for, while New York State for two highway canal crossings is asking for bids covering 750 tons. Other new work includes 700 tons for the Ludlum Steel Company, Watervliet, N. Y., and late awards include 300 tons for the Rumford Falls Power Company, Rumford Falls, Me., to Levering & Garrigues Company; 350 tons for the Evergreen telephone exchange, Brooklyn, to Eidlitz & Ross, and 2000 tons for the Midvale Steel Company at Nicetown, Philadelphia, to Levering & Garrigues Company. The Jones & Laughlin Steel Company is to furnish the 3000 tons of steel for the Revere sugar refinery at Boston. We quote mill shipments at 2.769c. to 3.169c., New York, depending on the urgency for delivery, and from warehouse at 3.25c. to 3.50c., New York.

Steel Plates.—Demand is so strong that extras are undergoing change calculated to give mills a price advantage where they have special capacity, say as to widths, and buyers who do not fabricate for competitive products, buyers such as the railroads, are facing the likelihood of covering under contracts with neither cancellation privileges nor price rebate concessions in the event of a falling market. Marine specification steel has again sold for 6c. and we also note the sale of 700 tons for export at 4.25c. at mill. Shipyards, it appears, are protected in increasing quantities for 1917 deliveries. We quote mill shipments at 3.919c., New York, and upward, with delivery in the third quarter mostly at 4.419c., New York, immediate business as high as 6c. and such for future business as the mills will consider at 2.919c., New York, and higher. Warehouse prices are 4.25c. to 4.50c., New York.

Iron and Steel Bars.—Increasing amounts of crop ends of shell steel, which runs 0.35 to 0.45 per cent carbon usually, are pressing the market, and can apparently be obtained for 2.50c. or less at mill. Much of it is of course returned for melting to the open-hearth furnaces. Upward of 150,000 tons of shell steel is still before the market and one late inquiry from an agent for the Allies is for 50,000 tons of 6 to 12-in. billets over the last half. In bar iron inquiries continue for deliveries extending into next year. For mill shipments of iron bars we quote 2.669c., New York, and of steel bars 2.769c. to 2.919c., New York, for deferred delivery and about 3.169c., New York, for early delivery. Warehouse prices for iron and steel bars are 3.25c. to 3.50c., New York.

Old Material.—With the exception of old axles and relaying rails, prices are weaker, with sharp declines on some commodities. Inquiry is light, about the only demand being for specialties. Eastern Pennsylvania consumers are not buying, except one or two, who are bidding very low prices. Brokers quote buying prices about as follows to local dealers and producers, per gross ton, New York, but holders of steel scrap are disposed to refuse to sell under present conditions, which they believe to be only temporary:

No. 1 heavy melting steel scrap (railroad or equivalent)	$14.50 to $15.00
Heavy steel scrap (Eastern Pa. specifications)	13.50 to 14.00
Relaying rails	.... 27.50
Rerolling rails (nominal)	16.75 to 17.25
Iron car axles	27.50 to 28.00
Steel car axles (for domestic use)	28.00 to 28.50
Steel car axles (for export)	31.00 to 32.00
No. 1 railroad wrought	21.50 to 22.00
Wrought-iron track scrap	18.50 to 19.00
No. 1 yard wrought, long	16.00 to 16.50
No. 1 yard wrought, short	13.50 to 14.00
Light iron	6.50 to 7.00
Cast borings (clean)	8.25 to 8.50
Machine shop turnings	7.50 to 8.00
Mixed borings and turnings	7.00 to 7.50
Wrought pipe	11.75 to 12.00
Old carwheels	16.00 to 16.50
Malleable cast (railroad)	12.75 to 13.25

Foundries are only buying cast scrap in small quantities. Quotations to consumers are as follows, per gross ton, New York:

No. 1 cast (machinery)	$17.00 to $17.50
No. 2 cast (heavy)	15.50 to 16.00
Stove plate	12.00 to 12.50
Locomotive grate bars	12.00 to 12.50

Cast-Iron Pipe.—The demand is less active. Public

lettings are few. Private buying keeps up fairly well, but the volume of business of this character is not up to what it was a few weeks ago. The quantity of pipe on which the city of Poughkeepsie, N. Y., opens bids on Thursday of this week is about 3300 tons, and not 2000 tons as stated in this report last week. On the same day Wellesley, Mass., opens bids on 170 tons of 8 to 12-in. pipe and 10 tons of fittings. It is understood that on the Rochester contract riveted steel pipe will be used and not cast-iron pipe. The price of carload lots of 6-in., class B and heavier, continues at $30.50 per net ton, tidewater, class A and gas pipe taking an extra of $1 per ton.

British Steel Market

Indian Ferromanganese Sold in the United States—Pig-Iron Exports Restricted

LONDON, ENGLAND, May 16, 1916.

(*By Cable*)

Tightness in the pig-iron market is intense with export permits withheld except to the Allies. Prices are nominal and stocks are decreasing. Tin plates are strong at 37s. and ferromanganese is nominal at £40 to £45. The Tata Iron & Steel Company has sold 1000 tons of Indian ferromanganese to America for June to August delivery at 15s. per unit. American semi-finished steel is $63 to $64, c.i.f. Quotations, mostly nominal, are as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 37s. against 36s. last week.

Cleveland pig-iron warrants, 86s. 6d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £19 15s.

Hematite pig iron, f.o.b. Tees, about 140s.

Sheet bars (Welsh) delivered at works in Swansea Valley, £12 10s.

Steel bars, export, f.o.b. Clyde, £18 5s.

Ferromanganese, £40 to £45 nominal, against £35 nominal a week ago.

Ferrosilicon, 50 per cent, c.i.f., £29.

Lack of Semi-Finished Steel Serious—Maximum Prices Exceeded

(*By Mail*)

LONDON, ENGLAND, May 2, 1916.—No great change in the British iron and steel situation has taken place, and the run of business, but not the production of steel, has been considerably curtailed by the Easter holidays. Shipping remains as troublesome as ever, the engagement of outward freight being still very difficult, which with the severer restrictions on exports is restraining business.

Cleveland warrant iron has been at a standstill. Export prices are now nominal, near 90s., business being a matter of negotiation, and apparently confined to France, for which country alone permits are obtainable. Warrant stocks were further reduced, but the drain has been checked. Domestic deliveries have been freer at the fixed price of 82s. 6d., although makers are trying to obtain a revision of the latter for delivery after June 30, owing to increased costs, and are, therefore, restricting their sales.

The scarcity of hematite continues unrelaxed, due to the great pressure of Government work, and exports are restricted to the Allies. Ore freights have again eased and furnace owners are indemnified by the Government on a freight basis of 17s. against their sales to home consumers at the fixed price of 122s. 6d., the export price remaining at about 140s.

THE SEMI-FINISHED STEEL SCARCITY

There is no relief in sight in semi-finished steel, and the market for Welsh bars is very wide. Whereas the Government price was fixed at £10 7s. 6d. it is understood that makers are booked well ahead, mostly at £12 to £13, while as much as £14 has been bid lately for export. There is but little American material offered at very irregular prices, the latest quotation for 4-in. billets being about $63 to $65 c.i.f. United Kingdom ports.

There is increasing uneasiness as to future developments, for it is expected that the home supply for the tin-plate and black-plate mills will be reduced again by 5000 to 10,000 tons a week, which must inevitably lead to a further reduction in tin-plate production.

In finished steel there is an enormous accumulation of orders for munitions, and merchant business is severely curtailed, while needs of allied governments are being attended to as far as possible. There is a keen French demand for bar iron and steel, but few makers have anything to sell. A few large inquiries have come forth for steel rails from Sweden and Italy, but the orders will probably go to Germany and America respectively.

The market for ferromanganese rules strong, although current f.o.b. quotations have not been altered so far. Producers are pretty fully booked over the remainder of this year, and the forward demand for shipment to America continues unabated.

The Ministry of Munitions issued recently a list of maximum prices for the various descriptions of pig iron, which has been followed by another for coke steel and all kinds of finished iron. In many cases these prices show considerable discrepancies as compared with the terms that have been ruling for some time past, which more particularly applies to raw steel. The maximum price for sheet bars and billets was fixed at £10 7s. 6d., which is farcical considering that this figure is about £3 a ton below the quotations at which business has been done.

Iron and Industrial Stocks

NEW YORK, May 17, 1916.

Uneasiness over international complications has practically disappeared, labor troubles are rapidly being settled and the stock market now seems to be responding to the generally favorable condition of business. Prices of all stocks have shown a marked tendency to advance in the past few days. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chal., com..	26 - 30	Ry. Stl. Spring, com.	41 - 43⅝
Allis-Chal., pref..	78½ - 84½	Republic, com. ..	46¼ - 56
Am. Can, com...	55¼ - 59¾	Republic, pref. ..	107⅞ - 109½
Am. Can, pref...	109 - 111½	Sloss, com.	55 - 56½
Am. Car & Fdy., com.	55½ - 62⅛	Sloss, pref.	95
Am. Car & Fdy., pref.	116¾ - 117	Pipe, com.	19⅛ - 23¼
Am. Loco., com..	68 - 71⅞	Pipe, pref.	50
Am. Loco., pref..	101½ - 101¾	U. S. Steel, com..	82¾ - 85⅞
Am. Steel Fdries.	52⅞ - 53⅞	U. S. Steel, pref..	116⅝ - 117
Bald. Loco., com.	84½ - 91⅝	Va. I. C. & Coke.....	52
Bald. Loco., pref.	107⅜ - 109	Westing. Elec...	58⅝ - 64½
Beth. Steel, com..	430 - 449½	Am. Ship, com.	41
Case (J. I.), pref.	86⅞ - 90	Am. Ship, pref.....	88¼
Colorado Fuel...	41½ - 45½	Chic. Pneu. Tool.	73⅝ - 74¼
Deere & Co., pref.	90½ - 90½	Lake Sup. Corp..	9⅞ - 10⅝
Gen. Electric....	165⅝ - 168⅝	Pa. Steel, pref.....	98½
Gt. No. Ore Cert.	40¼ - 42⅝	Warwick	10½ - 10½
Int. Harv. of N. J., com.	112 - 114	Cruc. Steel, com.	78¼ - 88¼
Int. Harv. of N. J., pref.	117	Cruc. Steel, pref.	114½ - 116
Int. Harv. Corp., com.	72 - 75½	Harb-Walk. Refrac., com.	87½ - 90
Lackawanna Stl..	69 - 73⅝	Harb-Walk. Refrac., pref.	103
Nat. En. & Stm., com.	22½ - 25	La Belle Iron, com.	51¼ - 53
Nat. En. & Stm., pref.	95	La Belle Iron, pref.	128
N. Y. Air Brake..	132 - 137	Can. Car & Fdy., com.	71 - 74
Pitts. Steel, pref.	98 - 100	Can. Car & Fdy., pref.	86
Pressed Stl., com.	46 - 48⅛	Central Fdry, pref.....	22
Pressed Stl., pref.....	100	Driggs-Seabury ..	131 - 138
		Midvale Steel....	58⅜ - 64⅝

Dividends

Fairbanks, Morse & Co., Inc., 1 per cent on the preferred stock, payable June 1. The dividend is for the two months ended May 31, and the company announces that hereafter dividends of 1½ per cent will be paid quarterly.

The Maxwell Motor Company, regular quarterly, 1¾ per cent on the first preferred stock, payable July 1. No action was taken on the inauguration of dividends on the second preferred stock.

The Harbison-Walker Refractories Company, quarterly, 1½ per cent on the common stock, payable June 1. This is an increase of ½ of 1 per cent over the former rate.

The Driggs-Seabury Ordnance Company, quarterly, 1¾ per cent on the first preferred stock; quarterly, 1½ per cent on the second preferred stock and quarterly, 5 per cent on the common stock, payable June 15.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, effective from April 10, 1916, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Pacific coast, 65c.; on plates, structural shapes, iron and steel bars, pipe and boiler tubes, tin plates, nails, spikes and wire. The foregoing rates to the Pacific coast are by rail only.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 2.50c. to 2.75c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive.	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive.	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 2.75c. to 4c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated Feb. 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3/16 in. take the price of 3/16 in.

Allowable overweight, whether plates are ordered to gage or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gages under ¼ in. to and including 3/16 in.	.10
Gages under 3/16 in. to and including No. 8	.15
Gages under No. 8 to and including No. 9	.25
Gages under No. 9 to and including No. 10	.30
Gages under No. 10 to and including No. 12	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths under 3 ft. to 2 ft., inclusive.	.25
Cutting to lengths under 2 ft. to 1 ft., inclusive.	.50
Cutting to lengths under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Wire Rods.—Bessemer, open-hearth and chain rods, $60, nominally.

Wire Products.—Prices to jobbers, effective May 1: Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, $2.45; galvanized, $3.15. Galvanized barb wire and staples, $3.35; painted, $2.65. Wire nails, $2.50. Galvanized nails, 1 in. and longer, $2 advance over base price; shorter than 1 in., $2.50 advance over base price. Woven wire fencing, 61½ per cent off list for carloads, 60½ off for 1000-rod lots, 59½ off for less than 1000-rod lots.

The following table gives the price per 100 lb. to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$2.50	$2.55	$2.60	$2.65	$2.80	$2.90	$3.00	$3.10
Galvanized	3.40	3.45	3.50	3.55	3.60	3.75	4.10	4.20

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from April 21, 1916, on black and galvanized steel and iron pipe, all full weight.

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	63	30½	⅛ and ¼	52	19
½	67	46½	⅜	53	20
¾ to 3	70	50½	½	57	33
			¾ to 1½	60	38

Lap Weld

2	65	45½	1¼	48	26
2½ to 6	68	48½	1½	54	33
7 to 12	65	44½	2	55	34
13 and 14	53½	..	2½ to 4	57	37
15	51	..	4½ to 6	57	37
			7 to 12	56	36

Reamed and Drifted

1 to 3, butt	68	48½	¾ to 1½, butt	55	32
2, lap	63	43½	1¼, lap	43	20
2½ to 6, lap	66	46½	1½, lap	49	27
			2, lap	50	28
			2½ to 4, lap	52	31

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	59	35½	⅛, ¼ and ⅜	52	29
½	64	45½	½	57	38
¾ to 1½	68	49½	¾ to 1½	61	40
2 to 3	69	50½			

Lap Weld, extra strong, plain ends

2	63	44½	1¼	50	28
2½ to 4	66	47½	1½	55	34
4½ to 6	65	46½	2	57	37
7 to 8	61	40½	2½ to 4	59	40
9 to 12	56	35½	4½ to 6	58	39
			7 to 8	52	33
			9 to 12	47	28

Butt Weld, double extra strong, plain ends

½	55	38½	½	44	26
¾ to 1½	58	41½	¾ to 1½	47	29
2 to 2½	60	43½			

Lap Weld, double extra strong, plain ends

2	55	38½	1½	44	25
2½ to 4	57	40½	2	44	25
4½ to 6	56	39½	2½ to 4	46	30
7 to 8	51	30½	4½ to 6	45	29

To the large jobbing trade an additional 5 per cent is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Sheets.—Makers' prices for mill shipments on sheets, of U. S. standard gage, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent cash discount in 10 days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	2.95 to 3.20
Nos. 9 to 10	3.00 to 3.25
Nos. 11 and 12	3.05 to 3.30
Nos. 13 and 14	3.10 to 3.35
Nos. 15 and 16	3.20 to 3.45

Above prices are for Bessemer stock. For open-hearth stock $2 per ton advance is charged.

Box Annealed Sheets, Cold Rolled

Nos. 17 to 21	2.70 to 2.80
Nos. 22 and 24	2.75 to 2.85
Nos. 25 and 26	2.80 to 2.90
No. 27	2.85 to 2.95
No. 28	2.90 to 3.00
No. 29	2.95 to 3.05
No. 30	3.15 to 3.25

Above prices are for Bessemer stock. For open-hearth stock $2 per ton advance is charged.

Galvanized Sheets of Black Sheet Gage

Nos. 10 and 11	4.00 to 4.25
No. 12	4.10 to 4.35
Nos. 13 and 14	4.10 to 4.35
Nos. 15 and 16	4.20 to 4.45
Nos. 17 to 21	4.35 to 4.60
Nos. 22 and 24	4.55 to 4.80
Nos. 25 and 26	4.70 to 4.95
No. 27	4.85 to 5.10
No. 28	5.00 to 5.25
No. 29	5.15 to 5.40

Above prices are for Bessemer stock. For open-hearth stock $2 per ton advance is charged.

Boiler Tubes.—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination added, on lap-welded steel tubes and standard charcoal-iron tubes, effective from April 15, 1916, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1½ in.	35	1½ in.	27
1¾ and 2 in.	47	1¾ and 2 in.	39
2¼ in.	44	2¼ in.	36
2½ and 2¾ in.	50	2½ and 2¾ in.	42
3 and 3¼ in.	55	3 and 3¼ in.	47
3½ to 4½ in.	56	3½ to 4½ in.	48
5 and 6 in.	49	5 and 6 in.	41
7 to 13 in.	46	7 to 13 in.	38

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
May	Lake	lytic	York	York	Louis	York	Louis
10	29.00	28.50	49.00	7.40	7.35	16.75	16.50
11	29.00	28.50	49.00	7.45	7.35	16.50	16.25
12	29.00	28.62½	49.25	7.50	7.40	16.25	16.00
13	29.00	28.62½	....	7.50	7.40	16.00	15.75
15	29.00	28.62½	49.25	7.50	7.40	15.62½	15.37½
16	29.00	28.62½	49.25	7.50	7.40	15.50	15.25

NEW YORK, May 17, 1916.

Copper is slightly higher, following increased interest on the part of consumers last week. Tin has been fairly active on one or two days but is lower. Lead has gained strength, due to export buying. Spelter has declined steadily in the absence of demand. Antimony is lower, with supplies plentiful, but interest is lacking.

New York

Copper.—Some good sized business is reported to have been done with France, and to a lesser extent with Great Britain and Russia, late last week, and at the same time domestic consumers became fairly active. The buying was such an improvement over that of the preceding two or three weeks that it was believed a fresh buying movement, which would assume large proportions, might be under way, but this proved a mistake and to-day the market is quiet again. The buying imparted new strength to the market and there is now less talk of wide spreads in the prices of any position. Third quarter electrolytic can be had at 28.62½c., New York, and Lake at about 29c., the latter quotation being nominal. Considerable resale prompt electrolytic is in the market, and it is somewhat easier at prices ranging from 29.75c. to 30.25c., and 29.50c. might be accepted. The London quotation for electrolytic has continued to advance. The price cabled yesterday was £158. The exports this month, including yesterday, totaled 9690 tons. In four months of this year the exports totaled 92,286 tons, as compared with 90,662 tons in the same period of 1915.

Tin.—For the most part the market has been dull. On Friday last there was a spurt of business in which probably 200 tons changed hands. Monday of this week was very quiet until almost the close, when Western consumers became active and bought at least 400 tons, taking positions ranging from spot to far futures. More business is now pending. Some large arrivals are due this month, one vessel bringing 800 tons from Batavia. A feature of the market is the plentiful supply of Banca tin now available. The arrivals this month total 1233 tons and there is afloat 4520 tons. The quotation for spot tin yesterday was 49.25c.

Lead.—Late last week the lead market was strengthened considerably by export buying of moderate size, more of which is promised. The activity caused independent producers to advance their prices to the level quoted by the leading interest. The general quotation yesterday was 7.50c. at New York, although in St. Louis the leading interest quoted 7.42½c., while others quoted 7.40c. There has been a good demand for Mexican lead in bond, and more could be sold if it were offered. Some of this lead is exported in pig form, and some is manufactured here and then exported subject to drawback duties. Some surprise was created by the readiness with which producers sold on the slight improvement in prices, an attitude which is construed to mean that they were tired of the dullness. The exports this month, including yesterday, totaled 2086 tons.

Spelter.—This metal is in the throes of a bad slump and the trade is wondering just how and when the decline in prices will be checked. For the past few days it has been impossible to interest consumers, and it is now conceded that they cannot be induced to buy until the daily declines are halted and prices take a turn upward. The New York quotation for prompt yesterday was about 15.50c. and that at St. Louis, 15.25c. The St. Louis quotation for June was about 15c.; July, about 14.50c., and third quarter, about 13.75c. to 14c. New war business is lacking; consequently the brass mills are not buying. The slump in spelter began shortly after the issuance of the Government figures on production. The exports this month, including yesterday, total 2449 tons.

Antimony.—In a dull market the quotation has declined to 33c. for spot Chinese and Japanese metal. June shipment from China can be had as low as 25c., c.i.f. Where there was a scarcity a few weeks ago, there is now an over-abundance. Consumers show no interest whatsoever.

Aluminum.—The market is unchanged at 58c. to 60c. for No. 1 virgin aluminum, 98 to 99 per cent pure.

Old Metals.—The only material displaying weakness is zinc scrap, which appears to be steadily declining. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	27.00 to 28.00
Copper, heavy and wire	26.00 to 27.00
Copper, light and bottoms	23.00 to 24.00
Brass, heavy	16.00 to 16.50
Brass, light	13.50 to 14.00
Heavy machine composition	20.00 to 21.00
No. 1 yellow rod brass turnings	16.00 to 16.50
No. 1 red brass or composition turnings	17.00 to 18.00
Lead, heavy	6.50
Lead, tea	6.00
Zinc	12.00 to 13.00

Chicago

MAY 15.—Both foreign and domestic buying of copper are holding this metal steadily at a high price level. Lead also is firm, but the recession in spelter prices is still in progress. Higher quotations for tin early in the week have been followed by even greater declines. We quote: Casting copper, 28c. to 28.50c.; Lake copper, 30c. to 30.25c.; tin, carloads, 49.50c., and small lots, 51.50c.; lead, 7.40c.; spelter, 16c.; sheet zinc, 25.50c.; Cookson's antimony, 50c.; other grades, 36c. to 37c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 23.50c.; copper bottoms, 21.50c.; copper clips, 22c.; red brass, 18.50c.; yellow brass, 14c.; lead pipe, 6c.; zinc, 13c.; pewter, No. 1, 29c.; tinfoil, 34c.; block tin pipe, 39c.

St. Louis

MAY 15.—Metals were quiet the past week, with no accentuated fluctuations in prices. The close to-day was as follows: Lead, 7.75c.; spelter, 18c.; tin, 53c.; Lake copper, 31.50c.; electrolytic copper, 31c.; antimony, 42c. In the Joplin ore district prices dropped $10 per ton on zinc blende, the average for the week's production of the district being $88. Calamine sold within a range of $55 to $70, basis of 40 per cent, with the average for the week $71 as a result of a considerable quantity of premium ore coming on the market. Lead ore sold at $96, with an average for the week of $97, brought about by premiums for choice lots. All the averages were also affected by the fact that the drop came late in the week after a period of higher prices early in the week. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 13.50c.; heavy red brass and light copper, 15.50c.; heavy copper and copper wire, 19c.; pewter, 24c.; tinfoil, 35c.; lead, 5.50c.; tea lead, 3.50c.; zinc 10c.

Iron and Steel Works Directory Ready

The American Iron and Steel Institute, 61 Broadway, New York, announces that its revised "Directory of the Iron and Steel Works of the United States and Canada" is now ready for distribution. This is a lineal successor of similar works published from time to time by the American Iron and Steel Association of Philadelphia. This edition has been completely rewritten and rearranged in order to make it more comprehensive and usable. It consists of one volume of 437 pages, and is offered for sale at $12 per copy.

PERSONAL

H. E. Dickerman, who has been elected president of the American Supply and Machinery Manufacturers' Association, is manager of the hoist department of the Chisholm-Moore Mfg. Company, Cleveland, Ohio. He was born in Southington, Conn., 36 years ago. He was educated in the Sally Lewis Academy, Southington, and his first employment was in the machine shop of the Blake & Johnson Mfg. Company, Waterbury, Conn. Subsequently he traveled for the New Era Mfg. Company, Waterbury, and then became identified with the Yale & Towne Mfg. Company, New York. His next connection was with the Chisholm-Moore Mfg. Company. Since his school days he has been ardently devoted to sports, including amateur bicycle riding, base ball and foot ball. He is an expert at trap shooting and ranks high among the amateurs of the United States. One of his notable feats was winning the New England championship at trap shooting. He has the reputation of being an indefatigable worker.

Samuel M. Vauclain, vice-president Baldwin Locomotive Works, has been elected a director of the Westinghouse Electric & Mfg. Company, succeeding C. F. Brooker, resigned. He was born in Philadelphia in 1856 and acquired his first training in mechanical skill in the locomotive and car building shops of the Pennsylvania Railroad at Altoona, Pa. Later he became associated with what is now the Baldwin Locomotive Works, of which he has been for many years vice-president. Mr. Vauclain is a director of the Standard Steel Works Company, Midvale Steel & Ordnance Company, Bucyrus Company, and Southwark Foundry & Machine Company.

Richard Martens, vice-president and managing director of the shipping and engineering firm of R. Martens & Co , Inc., sailed from New York May 15, on the Anchor liner California for Petrograd. During his six months' stay in the United States he has completed the organization of his American company, has studied the manufacturing situation and has addressed gatherings of prominent merchants and manufacturers in important trade centers. A number of American engineers will join Mr. Martens in Petrograd in June for a conference, after which they will tour Russia and ascertain in what form consumers will be able to use American products. These engineers, in the past six months have visited important plants and have prepared reports indicating what American manufacturers are now ready to sell.

Dr. W. C. Huntington, for some time in charge of the Chicago office of the Bureau of Foreign and Domestic Commerce, has been appointed commercial attaché at Petrograd by Secretary Redfield. He will sail from New York May 31 on the Frederick VIII and expects to arrive at Petrograd about the middle of June. He succeeds Henry D. Baker, who has resigned to reenter the consular service. The position in the bureau's Chicago office has been filled by the transfer to that city of Stanley H. Rose, formerly of the New York office, and the latter office is now in charge of D. E. Casey, who for a number of years has had charge of the work of the bureau's district offices.

F. D. Wilkerson has been made general manager of the mining and transportation department of the Brier Hill Steel Company, Youngstown, Ohio.

L. T. Thomas, formerly assistant chief engineer at the plant of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has resigned to become chief engineer of the new pipe and tube mills to be built by the Gary Tube Company, subsidiary of the United States Steel Corporation, at Gary, Ind. G. N. Biggerton succeeds Mr. Thomas as assistant chief engineer at the Youngstown plant.

James M. Nelson has resigned as superintendent of the open-hearth department of the Ohio works of the Carnegie Steel Company, Youngstown, Ohio. He was employed 22 years at the plant, beginning as a youth in the converting department. He will be succeeded by W. C. Bulmer, who is to be transferred from the engineer department. Mr. Nelson proposes to go to Birmingham, Ala., to study the latest developments in the duplex process of steel making, although having offers to take positions elsewhere.

John J. Cruice has been appointed Detroit representative of the Haynes Stellite Company, Kokomo, Ind. For the past eight years he has represented Edgar Allen & Co., high speed and carbon steels.

Wilbur S. Wilding has been appointed by the International Filter Company, Chicago, builder of water softening and filtration plants, as Eastern representative in charge of the New York office in the Woolworth Building. For the past few years he has had charge of the San Francisco office of the company.

G. W. Creighton has resigned as superintendent of the merchant mill department of the Steelton plant of the Pennsylvania Steel Company.

William M. Henderson, assistant to G. L. Vickery, superintendent of the frog and switch department of the Steelton plant of the Pennsylvania Steel Company, has resigned and will be succeeded by R. L. Gillespie, of the sales department.

Joseph E. Vincent, Jr., for a number of years connected with Wheelock, Lovejoy & Co., and the Swedish Iron & Steel Corporation, has formed a new company—the Iron, Steel, Metal & Alloy Company of America, with offices in the Liberty Tower Building, New York. The company will conduct a general commission or brokerage business for buying and selling iron and steel products, metals and alloys. Metal facilities cover brass, copper, tin, zinc, lead, aluminum, bronze, babbitt, bismuth, cadmium, etc. The company can also supply such alloys as chrome, nickel, tungsten, vanadium, manganese, silicon, etc. Mr. Vincent is general manager.

Henry C. Hammack has been elected secretary and treasurer of the Lima Locomotive Corporation, Lima, Ohio, to succeed John H. Guess, who recently resigned. Mr. Hammack has been connected with the company for eighteen years, having served 10 years as general field manager and 10 years as assistant secretary. In addition he is editor of the *Locomotive World*.

Earl C. Bowman has resigned as assistant sales manager of the Corbin Screw Corporation, New Britain, Conn., to take effect June 1. He will assume charge of one of the branch sales departments of the Willys-Overland Company.

The Yates Machine Company, Beloit, Wis., has appointed H. C. Force, Hoge Building, Seattle, as its Washington agent.

John M. Perkins has resigned as general sales manager and foundry superintendent of the Turner & Seymour Mfg. Company, Torrington, Conn., to become works manager of the Gilbert & Barker Mfg. Company, Springfield, Mass.

Byron F. Stowell has resigned as superintendent and mechanical engineer of the Van Norman Machine Tool Company, Springfield, Mass., to become master mechanic of Barney & Berry, Inc., skate manufacturers, of the same city.

George H. Holden, president, has retired from the G. S. Blodgett Company, Burlington, Va., and John S. Patrick, secretary and treasurer of the company, assumes entire control. This business was established in 1847 and incorporated in 1892. The company manufactures the Blodgett portable baking oven and is a jobber in sheet iron, brass goods, iron pipe, sewer pipe, kitchen utensils, gasoline engines, pumps, etc. Mr. Holden has had a long and successful career as a business man. Mr. Patrick has been with the company for 25 years. In addition to being sole owner of the G. S. Blodgett Company he is the treasurer and a director of the Magnesia Talc Company, with other important business connections.

The Corcoran-Victor Company, Cincinnati, Ohio, has elected officers for the ensuing year, as follows: President, E. W. Edwards (also president of the Edwards Mfg. Company); vice-president, Thomas J. Corcoran, and secretary and treasurer, T. H. Carruthers.

The Corcoran-Victor Company is a recent consolidation of the Corcoran Lamp Company, Victor Lamp Company and Victor Auto Parts Company.

Clarence L. Burger and W. H. Crichton Clarke, previously associated with the late Edward B. Moore, formerly commissioner of patents in the firm of Moore & Clarke, have associated themselves under the firm name of Burger & Clarke, and will continue in the offices of Mr. Burger at 2 Rector Street, New York, the practice especially of the law of patents, trademarks and copyrights.

Charles E. Shearer, general agent of the Lloyd-Thomas Company, factory appraiser and engineer, has opened an office at 1307 First National Bank Building, Cincinnati, Ohio.

Philip Schmitt, formerly superintendent of the electric furnaces of the United Steel Company, Canton, Ohio, has charge of the instruction of operators and organization of the new Heroult installation of the Harrow Spring Company, Kalamazoo, Mich.

Newlin T. Booth has been made superintendent of the Penn Works of the Penn Marine & Ordnance Castings Company, Inc. He was foundry metallurgist of the Penn Steel Castings & Machine Company, Chester, Pa., now one of the companies making up the new organization.

Stephen L. Selden has resigned as vice-president of J. G. White & Co., Inc., and has resumed the practice of the law in a new firm under the name and style of Selden, Walmsley & Kohlman, which will have its offices at 61 Broadway, New York.

O. E. Thomas, 626 Washington Building, Los Angeles, Cal., has been appointed by the Terry Steam Turbine Company, Hartford, Conn., district sales manager for a territory covering Arizona and the southern portions of California and Nevada.

Charles W. Pike, Lackawanna Steel Company, San Francisco, left that city on May 13 for a four months' journey around the country.

Edgar E. Burnet, assistant superintendent, Judson Mfg. Company, San Francisco, who has been spending some time in the East, is about to return to the Pacific coast. The Judson Mfg. Company has a rolling mill with a 40-ton open-hearth furnace, rolling chiefly in bar sizes, although including 4 x 4-in. angles, and it has a structural shop and is equipped for a general machine shop business.

George G. H. Marvin, for 35 years connected with the L. & I. J. White Company, Buffalo, N. Y., maker of edge tools and machine knives, and for 23 years president, treasurer and general manager of that concern, has resigned. He has not as yet made any new business connections.

Gary Tube Company Incorporated

On May 13 the Gary Tube Company was incorporated with an initial capital stock of $100,000. This is a new subsidiary of the United States Steel Corporation, which will build blast furnaces, steel works, pipe and tube mills at Gary, Ind., a detailed account of which was printed on page 813 of THE IRON AGE of March 30. Robert W. Campbell of Chicago, son-in-law of Chairman E. H. Gary of the United States Steel Corporation, is one of the list of incorporators. Active work on the immense plant, which will probably not be completed before the end of 1917, is expected to start very soon.

Extensive improvements have been made at the plant of the old Vulcan Charcoal Iron & Steel Company, Crum Lynne, Pa., since it was purchased by H. S. Walker, 1532 Sansom Street, Philadelphia, and renamed the Eddystone Steel Company. The buildings, containing 40,000 sq. ft., which were built in 1901, have been overhauled and under-drained, likewise the water system which takes from Crum Creek has been repaired. The equipment, which includes an open-hearth furnace with a capacity of 60 tons a day (four heats), has been overhauled, also the electric cranes. The stock sheds have been practically rebuilt.

The New England Freight Situation

The transfer points on the lines of the New Haven Road have become so blocked that the Eastern Freight Accumulation Conference has placed an embargo, effective at midnight, May 13, upon less than carload freight destined to or to be transferred at Bridgeport, New Haven, Waterbury, Plainville and Hartford, Conn., and Providence, R. I. This will seriously affect shipments from all other points on the New Haven system and from New England manufacturing cities north of the New Haven lines. It is believed this embargo will be necessary for only a short time.

To relieve the situation at Boston terminals the New Haven, Boston & Maine and Boston & Albany roads have asked the permission of the Interstate Commerce Commission to impose additional charges for storage which will make the new charges at Boston as shown in the following schedule:

After 48 Hr. Free	First Day	Second Day	Third Day	Fourth Day and After
New Haven.....	$2.00	$2.00	$7.00	$7.00
Boston & Maine..	2.00	2.00	3.00	4.00
Boston & Albany..	2.00	2.00	3.00	4.00

To bring about more rapid removal of freight at various terminals, railroads entering Boston will put in effect increased charges for the storage of less than carload freight as scheduled below:

First three days—10c. per ton per day.
Next five days—20c. per ton per day.
After eight days—40c. per ton per day.
Minimum charge for the three-day period, 25c.; for the five-day period, 50c., and after eight days, $1.

The present rates are much lower. The roads also decided to make a charge of 25c. a ton for unloading package freight into their warehouses.

To relieve the Boston situation to a degree the Merchants' and Miners' Transportation Company has made a proposition to establish a trucking system similar to those now employed successfully in Baltimore and Washington, whereby all freight will be immediately removed from freight terminals upon its arrival. Some manufacturers are pessimistic about it, but the majority feel that forces now co-operating to relieve the congestion will soon help the situation materially.

Baldwin Locomotive Buys Southwark Foundry

The Southwark Foundry & Machine Company has been acquired by the Baldwin Locomotive Works, and will be operated without change in organization. The production of the Southwark Foundry is entirely a distinct line, having nothing to do with locomotive manufacture. Its lines of manufacture are internal combustion engines, turbines, pumps, hydraulic presses, blowers and other machines. About four years ago the Southwark Company was purchased by Alba B. Johnson and Samuel M. Vauclain, president and vice-president, respectively of the Baldwin Locomotive Works. The capitalization of the Southwark Company is $650,000 preferred stock, $650,000 common stock and $600,000 5 per cent bonds.

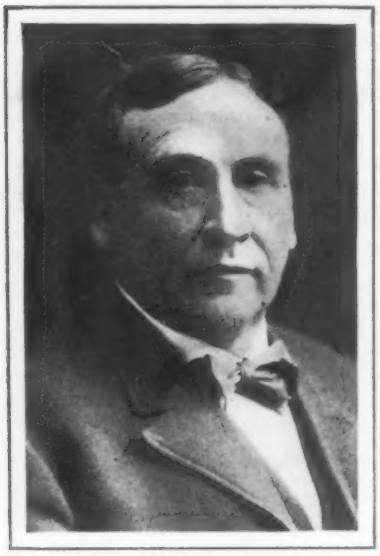
Delaware Steel Foundries Consolidate

The consolidation of the American Manganese Steel Company and the Brylgon Steel Casting Company, both of New Castle, Del., has been announced. Both are converter foundries, the former specializing in manganese steel castings and the latter in the regular run of carbon and alloy small castings. The new company will probably be known as the American Manganese Steel Company, with Walter Brinton continuing as president and general manager. The Brylgon plant will be improved and enlarged considerably.

The first of several Lake freight boats that are being built for the Pittsburgh Steamship Company was launched at the Lorain yards of the American Shipbuilding Company, May 6. It was named the D. G. Kerr, after the first vice-president of the United States Steel Corporation. The Kerr is a 600-ft. boat designed to carry 12,000 tons.

OBITUARY

GEORGE M. SKILES, president Ohio Seamless Tube Company, Shelby, Ohio, died May 5 from heart failure, resulting from two attacks of pneumonia. He was born in Cumberland County, Pa., and was 64 years old. His parents removed to Shelby while he was a child. He was graduated from the Baldwin University at Berea, Ohio, in 1876, and entered upon the practice of law, which he never abandoned, giving special attention to railroad and personal injury cases, and gained distinction. He was one of the original owners of the Shelby Steel Tube Company, merged into a larger corporation in 1900 and afterward bought by the United States Steel Corporation, when its business was removed to Elwood, Pa. In 1908, when the Shelby property was purchased from the Steel Corporation, he was instrumental in forming the Ohio Seamless Tube Company, of which he became president, holding that position until his death. He was greatly interested in his home town, actively assisted in establishing many industries and enterprises, and was thus largely instrumental in making Shelby an industrial center. At the time of his death he was president of five local companies and a director or large stockholder in other industrial enterprises and financial institutions. He leaves his widow, two sons and two daughters.



GEORGE M. SKILES

MORTON B. SMITH, head of the Morton B. Smith Company, old metals, New York, died May 16, aged 74 years, from an operation for appendicitis. Mr. Smith's house is the oldest in the old metal trade in direct succession on this side of the Atlantic. Few men have enjoyed a higher reputation and greater popularity among their colleagues in any trade than Mr. Smith. He leaves four sons and one daughter. The business will be conducted as heretofore.

A Perth Amboy Rate Complaint Sustained

WASHINGTON, May 16, 1916.—The Interstate Commerce Commission has passed on a complaint of the C. Pardee Works, Inc., Perth Amboy, N. J., manufacturer of steel billets, bars and other products, marketed principally in New England and the Atlantic seaboard territory. For the purpose of making rates on scrap iron and on finished products to and from the New England States, Perth Amboy is in a group extending from Jersey City to the Susquehanna River. The complainant's principal competitors are in this group, the most distant competing mill in the group being at Harrisburg. The mills in that group are on a rate equality in drawing scrap iron from and marketing their products in the New England States. The same equality exists as to Buffalo, Syracuse and other points in New York State. The group competitors of the Perth Amboy plant have rate advantages in shipping to Western markets, and the complainant objects to being grouped with Harrisburg and other Eastern mills on steel and iron to New England while denied a similar rate parity with them on coal and limestone. The decision orders the 25 defendant railroad lines to rearrange present routes and rates so as to remove the unfair conditions.

Amalgamated Bar-Iron Scale

The Amalgamated Association, in session in Cleveland, Ohio, has completed the scale which it will present to the bar-iron mills for the year beginning July 1. It calls for advances in all kinds of labor. The bottom rate on puddling, applicable when bar iron is 1c. or less, is advanced $1 per ton, or from $5.50 to $6.50. The advances for each 5c. per 100 lb. advance in bar-iron prices are changed from 10c. to 15c. up to 1.25c. bar iron, which by the new scale would call for a puddling rate of $7.25 instead of $6. Above 1.25c. bar iron the increments are 20c., as formerly, so that the new scale demands $1.25 per ton more for puddling when bar iron is 1.30c. or higher. The busheling, muck and puddle mill scales are all advanced 15 per cent. Various changes were ordered in the footnotes of the iron mill scales.

The association is still in session formulating the sheet and tin-plate scales which will likely be completed this week. As yet no dates have been fixed for conferences with the bar-iron or sheet and tin-plate mills, but the first of these will probably be held late this month or early in June.

Good Buying of Locomotives

Orders for over 175 and inquiries for nearly 150 locomotives have appeared in the last two weeks, making May to date a very good month, despite the high cost of construction. The Pennsylvania Railroad has ordered 75 Mikado freight locomotives from the Baldwin Locomotive Works for its lines East, while the American Locomotive Company will build 25 switching, 25 consolidated and 10 Pacific locomotives for the Boston & Maine; 8 freight locomotives for the Maine Central and 12 switching locomotives for the Terminal Railroad Association of St. Louis. The Lehigh Valley is inquiring for 40 Santa Fe and for 30 Pacific locomotives, the Seaboard Air Line for 20 Mikado and Mallet locomotives and the Chesapeake & Ohio for 25 to 50 Mallets. The Wabash has withdrawn its inquiry for 25 Santa Fes. The Kansas City Southern denies having placed an order for 10 locomotives.

Total locomotive orders this year thus far are 1775, of which about 280 are foreign. In 1915 the foreign locomotives ordered were 621, which is the record for some years.

Pennsylvania Steel Company's Answer

The Pennsylvania Steel Company filed in the Federal Court at Trenton, N. J., May 16 its answer to the suit of Joseph H. Brandt of Philadelphia to restrain the company from selling its properties to the Bethlehem Steel Company. It admits that the products of the two companies are similar to some extent, but denies that the products of its subsidiaries are in competition with the Bethlehem Steel Company to such an extent as to render their acquisition illegal. It is denied that the intent of the proposed sale is to create a monopoly or substantially to lessen competition.

The 60-day period required for the taking of the various legal steps involved in the acquisition of the Pennsylvania Steel Company properties by the Bethlehem Steel Company expires in the early part of June.

To celebrate the completion of a new addition, the Fafnir Bearing Company, New Britain, Conn., gave an entertainment, lunch and dance for the employees and their friends on Saturday, May 13, using for this purpose one floor of the new building, which was decorated with bunting. Over 800 people were present. The offices of the company are soon to be moved to the top floor of the new building. The enlarged factory space now available is already proving insufficient and ground has been broken for another addition which will again largely increase the output of the company.

Pittsburgh and Nearby Districts

Pittsburgh manufacturers will profit through the proposed new combination of freight rates on iron and steel articles shipped to Texas common points, via St. Louis and Texarkana, which are being considered by traffic officials of the interested railroads at a meeting being held in St. Louis this week. The rates expected to be adopted are 1c. per 100 lb. under the rates now ruling, the only exceptions being on pipe, expanded sheet metal and expanded metal lath, the rates on which will continue on the present basis, which is 59.1c. per 100 lb., from Pittsburgh to Texas common points. In the case of structural steel, etc., the rate to points within a radius of 260 miles of Texarkana will be 79.1c., instead of 80.1c., as now.

The eleventh annual convention of the Natural Gas Association of America and the Association of Natural Gas and Supply Men opened in Pittsburgh on Monday morning, May 15, with an exhibit of natural gas appliances and supplies in Machinery Hall of the Pittsburgh Exposition.

The Howard Stove Company, Beaver Falls, Pa., has been absorbed by the Zenith Stove & Heater Company, Pittsburgh. The main offices will be in the latter city. John C. Bash is general manager of both plants.

The Jones & Laughlin Steel Company is adding four more stories to its office building which occupies an entire square on Ross Street, Pittsburgh. The building will then be 12 stories high. The addition will cost about $160,000.

The McCoy-Brandt Machinery Company, dealer in new and second-hand machinery, formerly located in the House Building, Pittsburgh, has removed to new and larger quarters at 219 Penn Avenue.

Playgrounds are being built by the Pittsburgh Steel Company for the use of children of its employees at its blast furnaces, steel works and wire mills at Monessen, Pa. The grounds will be equipped with all kinds of pleasure devices. Special employees of the company will supervise the children.

The Western Conduit Company, subsidiary of the Youngstown Sheet & Tube Company, has made plans for doubling the electro-galvanizing and armored conductor departments of its plant at Youngstown, Ohio.

The Fahnestock Mfg. Company, Union Bank Building, Pittsburgh, has acquired a plant at Avonmore, Pa., and will operate a foundry, making castings. E. T. Williams is secretary.

The foundry of the McVay-Walker Company, Braddock, Pa., was damaged by fire May 14, the amount being estimated at $50,000. The company makes bath tubs and bath room supplies. It is probable the foundry will be rebuilt on a larger scale.

The Carnegie Steel Company has placed an order with the C. O. Bartlett & Snow Company, Cleveland, Ohio, for the installation of a sintering plant at its blast furnaces at Mingo Junction, Ohio, to have a capacity of about 300 tons of sinter per day.

By the issue of $61,250 common stock, the Wheeling Mold & Foundry Company, Wheeling, W. Va., will increase its capitalization to $1,000,000. The increase in stock was authorized in January, 1914, and all was issued but the small amount of treasury stock now offered to stockholders at $50 a share.

Gee Sing Sam of Canton, China, was in Pittsburgh for three days last week negotiating for the purchase of iron, steel and railroad supplies to the stated amount of $3,000,000. He said he was representing a Chinese syndicate, which has been seeking to purchase large quantities of machinery and supplies in this country. He has already placed some contracts in Pittsburgh and expects to place others.

Bids will be received by the board of public education of New Kensington, Pa., of which B. F. Davis is secretary, until 7 p. m., May 26, for one 20-in. lathe, 10-ft. bed, motor driven, for the industrial department. Specifications may be had from the board.

From time to time reports are printed involving the Allegheny Steel Company, Brackenridge, Pa., in a merger with other steel companies or as about to sell to a new interest. Officers of the company state that it has no such negotiations on. It recently completed the building of another open-hearth furnace, of 85 tons capacity per heat, which makes a total of seven furnaces ranging from 75 to 85 tons capacity each. All departments of the works are operating to full capacity.

The Hoffman Process Company, Pittsburgh, is developing processes for the recovery of by-products from mill and mine wastes. It has one plant in operation for the recovery of by-products from mine water and a second plant under construction for the recovery of sulphuric acid from waste pickle. Several valuable by-products are produced in its processes, namely, ferric hydrate, basic ferric-sulphate and ferric oxides.

The Miller Saw Trimmer Company, Pittsburgh, has increased its capital stock from $5,000 to $396,600.

The Featherweight Piston Company, 11 Guyman Way, Pittsburgh, has equipped a shop with machine tools for the production of aluminum alloy pistons. It was recently incorporated in Delaware with a capital stock of $50,000 by John W. Cushing, W. J. C. Tygard and W. A. Gillard, all of Pittsburgh.

The United States Electric Steel Company, Pittsburgh, with a capital stock of $5,000, has been incorporated by W. B. Wallis, South Emily and Ewing streets, Crafton, Pa.; F. H. Penney, 110 Bingham Street, Pittsburgh, and William Davidson, 6123 Callery Street, Pittsburgh, to manufacture iron, steel and allied products.

The National Stamped Sheet Metal Company, Beaver Falls, Pa., with a capital stock of $10,000, has been incorporated by James P. Laden, Daniel H. Jones, L. G. Spencer, and others, to manufacture stamped and embossed metal specialties. W. W. Potts, Federal Building, Beaver Falls, is treasurer.

The Auto Metal Body Company, Pittsburgh, with a capital stock of $5,000, has been incorporated by M. K. Flannery, 2114 Murray Avenue, Pittsburgh, Thomas Skarry, and Louis F. Vremsak, to manufacture automobile bodies and kindred products.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., has received a contract from the United States War Department for 88,000 3-in. shells. The company has been turning out munitions for the Allies, and therefore has all the machinery necessary to start work at once on this new contract, part of which is for quick delivery. Inspection of the equipment of the plant of this company and the quality of its output was made recently by the Government, and the result was so favorable that the contract followed.

Detroit Foundrymen's Annual Meeting

Members of the Detroit Foundrymen's Association, numbering nearly 250, held their eighth annual banquet at the Tuller roof garden on Wednesday evening, May 10. Officers for the ensuing year were elected as follows:

President—Robert Carolin, R. Carolin Company.
Vice-president—Herbert Osborn, Cadillac Motor Company.
Secretary—E. W. Kessler, Detroit Steel Casting Company.
Treasurer—E. I. Chase, Cadillac Motor Company.
Executive Committee—J. W. Collins, Aluminum Castings Company; W. Bruce Howard, Atlas Foundry Company; Edward Whittemore, Packard Motor Company; W. A. Fletcher, American Blower Company.

The retiring president, A. F. S. Blackwood, who has held the office for the last two years, was given a loving cup by the members and a silver vase by his general staff. W. P. Putnam, Detroit Testing Laboratory, who was toastmaster, paid a glowing tribute to the work carried out by the retiring president in raising the standard of the association, which now has an active membership of over 250.

The Hirsch Electric Mine Lamp Company, 314 North Thirteenth Street, Philadelphia, Pa., has opened a New York office at 6 Church Street, in charge of H. Olmsted.

The MacArthur Concrete Pile & Foundation Company has removed its New York office to the Equitable Building, 120 Broadway.

STRIKES AND WAGE ADVANCES

Pittsburgh and Vicinity

Operations are being resumed rapidly in the works of the Westinghouse Electric & Mfg. Company, East Pittsburgh, and it is believed that by the end of this week all the departments will be running practically in full. President E. M. Herr states that the company has decided to renew the grant of bonuses to all shop employees. It has taken into account the fact that many employees did not strike, but were forced to give up work on account of threats from the strikers. The status of all employees now at work is, therefore, the same as it was before the strike. No concessions have been made by the company, either in wages or working conditions, but it is possible that later on a conference will be held between officials of the company and a committee of the men, with a view of adjusting certain conditions. The American Federation of Labor has called off this strike.

At the works of the Union Switch & Signal Company nearly all employees have returned to work, and all will be taken back, with the exception of two men who were discharged for being active in the strike and inciting riot. At the other Westinghouse plants—Westinghouse Machine Company, Pittsburgh Meter Company, Westinghouse Air Brake Company and R. D. Nuttall Company—practically all the men have returned to work with exception of some of the machinists, and it is expected that within a very short time all these plants will be running in full.

A grand jury at Pittsburgh will probably take up this week investigation of the riots of two weeks ago at the plants of the McClintic-Marshall Company at Rankin and the Carnegie Steel Company at Bessemer. The only trouble at these plants was that a mob of Westinghouse strikers marched on them, tore down fences and demanded that the men cease work. A number of the strikers who incited the riots are either in jail or under heavy bail and are expected to be convicted.

The Greenville Steel Car Company, Greenville, Pa., has given its employees a voluntary advance in wages. The amount of the increase varies, the company making an effort to equalize wages as far as possible. Its plant has been operating practically night and day for some months and has had no labor troubles of any kind.

On Sunday, May 14, the striking employees at the works of the Aluminum Company of America met at New Kensington, Pa., and by a vote of 153 to 59 decided to return to work. More than 2000 returned on Monday, after a strike of about two weeks. No concessions of any kind were made by the company.

At the Woods Run works of the Pressed Steel Car Company all departments are running in full, while at the McKees Rocks plant, which is the larger works, all departments are in operation, but not in full as yet. It is estimated that the plant was operating to about 80 per cent on Monday, May 15. It is believed that by the end of this week all departments of the McKees Rocks plant will be running to full capacity. No concessions were made by the company, the men returning to work under the same conditions and wages as before. In the past six months wages at both plants have been increased by the company from 25 to 30 per cent. J. B. Rider, general manager, states that the company has enough orders for cars to operate practically in full until August.

The strike of machinists in the shops at Youngstown, Ohio, is still on, but is likely to be settled soon. Last week conferences were held by Fred C. Croxton and George F. Miles, mediators of the Ohio State Industrial Commission. So far the conferences have been held only with the leaders of the strikers, but this week they will also be held with the employers. It is practically certain that the demands of machinists for an 8-hr. day with the same pay as for nine hours will not be granted.

The plant of the Sharon Foundry Company, Sharon, Pa., has been closed by a strike. the molders demanding an 8-hr. day with 9-hr. pay, which the company has refused to grant.

The foundry of the Shenango Machine Company, Sharon, Pa., is still closed on account of the strike of the molders who demand an 8-hr. day with 9-hr. pay.

Rolling-Mill Wage Advances

Wage advances in iron bar mills and sheet and tinplate mills governed by wage scales of the Amalgamated Association were made as the result of the bi-monthly examination of sales sheets of these products at Cleveland, Ohio, last week. It was found that the average price on shipments of iron bars in March and April was 1.60c., this entitling the puddlers to $7.40 per ton for May and June, as compared with $6.60 for March and April. The average price on light black sheets Nos. 26, 27 and 28, was 2.50c., this entitling the sheet mill hands to an advance of 8 per cent in wages for May and June over March and April. The average price on tin plate per base box on shipments in March and April was $3.70, as compared with $3.35 for the two previous months, this entitling tin-mill hands to a restoration of the 6 per cent wage reduction and in addition an advance of 5 per cent above the base price. The tin-plate scale is based on coke tin plate at $3.50 per base box. These adjustments give the men the largest wages in the respective mills named that have prevailed in some years.

The A. M. Byers Company, Pittsburgh, manufacturer of wrought-iron pipe, operates the largest single puddling plant in the United States, which is located at Girard, Ohio. This company does not recognize the Amalgamated Association, but has always paid a higher wage rate than called for in that scale. For March and April the Amalgamated rate for puddling was $6.60 per ton, but the A. M. Byers Company paid $6.75 in those two months. For May and June the Amalgamated rate for puddling has been fixed at $7.40 per ton, but the A. M. Byers Company will pay its puddlers $7.42½.

The New England Situation

While much unrest prevails in New England in labor circles, so far there has been little increase in the troubles involving skilled labor. The most serious development the past week has been at the Fisk Rubber Company, Chicopee Falls, Mass. The machinists at this plant have been on strike for several weeks, and last week trouble spread to other departments, until some 1600 men are now actually on strike and 2600 altogether are idle. The State Board of Arbitration and Conciliation has been at work and the company has made an offer to the strikers which it now appears will be accepted. It is understood this proposition agrees to grant an 8-hr. day, with time and a half for overtime and some concessions in regard to reference committees.

In Greenfield, Mass., the Greenfield Tap & Die Corporation and F. E. Wells & Son posted notices asking for suggestions from employees which would tend to make their work more pleasant. In response several petitions were presented, which were nearly identical in tenor, proposing a 9-hr. day, time and a half for overtime and Saturday half-holiday with pay. These suggested changes will be considered by a newly formed Citizens' Alliance. The board which will consider the petitions comprises representatives of the manufacturers, the employees and citizens. Among the representatives of the manufacturers are Frank H. Paine, treasurer of the Greenfield Tap & Die Corporation, and John E. Donovan of the Goodell-Pratt Company. It is the hope of the Citizen's Alliance to bring about satisfactory conditions without strife or labor disturbance.

An unorganized strike is on at the Ansonia Mfg. Company, Ansonia, Conn., about 600 men being out. The strikers seem to be undecided as to the amount of increase in wages they desire, the only thing on which they seem to be agreed being a shorter working day. A small strike has occurred of about 75 men at the West rolling mill of the Benedict & Burnham branch of the American Brass Company, Waterbury, Conn. It is believed that an amicable adjustment will be promptly made. There was also a small strike of about 20 machinists, May 10, at Bridgeport, Conn., in the plant of the Bridgeport Brass Company. The strike was of short duration, as the men were given the same wages

and hours as the machinists in other plants in Bridgeport are receiving.

At the Acme Shear Company, Bridgeport, Conn., 53 bench molders went out on strike a week ago, and the employees and officials failed to agree upon a wage difference of about 15c. per day. When these men went for their pay envelopes on May 13 they received notices of discharge. The strikers were not affiliated with any of the labor unions.

About 60 operatives at the plant of the Fales & Jenks Machine Company, Pawtucket, R. I., went on strike May 6 and were joined May 8 by 75 others. The men demanded an increase of about 15 per cent in wages and refused an offer of an increase amounting to about 7½ per cent made by the company.

There is a feeling in several cities that unrest in unskilled labor circles may cause serious trouble in the near future, and that it may be a forerunner of further demands on the part of skilled machinists in some places. At present the situation is one of "watchful waiting" on both sides.

Conditions in Cincinnati and Vicinity

Many misleading reports as to the Cincinnati labor situation have been circulated, probably based on statements issued by union officials, that a carefully revised statement, supplementing last week's report, is considered essential to present:

Number of men at work April 29	13,849
Number of men at work May 12	12,552
Number of strikers who returned to work up to May 12	928

The above figures embrace two or three plants not included in the previous week's report, and are as nearly correct as it is possible to make them. This statement shows that nearly one-half of the strikers have returned to work, while quite a large number of new machinists and young apprentices have been added to different forces.

About 50 machinists walked out of a plant at Hamilton, Ohio, upon refusal of the employers to reinstate a discharged workman. Patternmakers in two plants there are still out. No new developments are reported at Piqua and Urbana, Ohio, and the plants affected there are operating with reduced forces.

Milwaukee Developments

An effort to minimize if not entirely prevent serious labor trouble in Milwaukee, Wis., has been made by 35 of the largest metal trades concerns of that city in addressing a petition to the Industrial Commission of Wisconsin to make a thorough investigation of working conditions, to the end of enabling the Milwaukee employers to afford "equally favorable conditions as enjoyed by employees in competitive industries similarly situated." It is expected to go a long way toward solving an anticipated problem with regard to the 8-hr. day, inasmuch as it is expected that the machinists of the Milwaukee district will soon present an organized demand for shorter working hours and advanced pay, having been engaged in preparing for the move for several months. No statement on the action of the employers has come from the unions since the petition to the Industrial Commission was made public.

The car and locomotive shops of the Chicago, Milwaukee & St. Paul Railroad, at Milwaukee, Wis., which have been experiencing a strike of carpenters, trucksmiths and laborers for several weeks, is again operating at normal capacity. Most of the strikers have returned to work at an advance of 1½c. per hour and the remainder will be treated as newcomers if they ask employment. The demands of the machinists on the Milwaukee system for an 8-hr. day at the present pay is still in arbitration between the officials of the system and a committee of the machinists at Chicago.

A San Francisco Settlement

A compromise wage agreement adopted by a joint conference has been accepted by San Francisco employers and the Boilermakers' and Iron Shipbuilders' Union, granting an advance in wages for various classifications. The agreement applies from May 1.

Cleveland and Vicinity

The James B. Clow & Sons Company has reached an agreement with its employees at its plants at Coshocton and Newcomerstown, Ohio, averting a possible strike. The men have been granted an advance of 25c. per day, but the hours of labor remain unchanged. The minimum wage has been fixed at $2 per day and an arrangement has been entered into whereby each employee will receive a bonus of 5 per cent of his wages at the end of seven months of steady employment.

The Garford Mfg. Company, Elyria, Ohio, has reduced its regular working day from 10 to 8 hr. and will pay its employees one-and-one-quarter time for the ninth hour and one-and-one-half time for the tenth hour when the plant is operated longer than 8 hr. It has also made an advance on piece rates so that all employees will receive an advance of about 7½ per cent.

About 250 molders employed at the foundry of the Walworth Run Foundry Company and a similar number at the foundry of the Forest City Foundry & Mfg. Company, Cleveland, Ohio, went on strike last week demanding an advance from $2.50 and $3 to $4 per day minimum wages, a higher scale for piece work, and a closed shop.

The Glauber Brass Mfg. Company, Cleveland, Ohio, has reduced its working day from a 10 to a 9-hr. schedule with no decrease in pay. About 250 men are affected.

The Donovan Wire & Iron Company, Toledo, Ohio, has reduced its working day from 10 to 9 hr., with no reduction in wages. About 150 men are affected.

Other Localities

The employees of the Colorado Fuel & Iron Company's steel works at Pueblo have been granted an increase in wages, adding $40,000 to the company's monthly payroll. The increase, effective May 1, averages approximately 10 per cent. A similar increase was granted last February.

A 20 per cent increase in wages and the 8-hr. day schedule at the plant of the Willys-Overland Company, Toledo, Ohio, became effective May 11. Nearly 18,000 factory employees are benefited, and $25,000 is added to the weekly payroll.

The strike which was called some months ago on the Jersey City warehouse of Joseph T. Ryerson & Son, was settled on May 11 and shipments on the full operating scale have been resumed.

The new bonus system of the Carpenter Steel Works, Reading, Pa., is reported a success. Owing to the urgent demand for the company's products, every means of efficiency on the part of the workmen is demanded. The requisite is that no time may be lost by the workers without forfeiting the bonus which they would have received had they worked full time. To the class of workmen receiving from 15 to 17½c. an hour is given a bonus of 12½ per cent.; those receiving 17½ to 20c. an hour are increased 10 per cent; from 20 to 25c. an hour, 7½ per cent, and above 25c. an hour, 5 per cent. Those who are not steady workers will not receive the bonus.

Rapid repairs have been recently completed at Paraiso, Panama Canal Zone, on a spud for a 15-yd. dipper dredge, in spite of very adverse working conditions. The spud was a steel structure, 76 ft. long, 48 in. square, weighing about 45 tons equipped. On account of its size the work had to be done out in the open. The laying out work was done, therefore, in the cool of the day, because the noon heat expanded the plates 1¼ in. beyond normal. In spite of these handicaps the work was done more quickly and at less cost than would have been the case, under present war conditions, if the work had been sent to a point in the United States.

The American Brass Company has removed its offices from 99 John Street to rooms 715-725 Western Union Building, 195 Broadway, New York.

Machinery Markets and News of the Works

QUIETER TREND EVIDENT

More Discrimination Shown by Buyers

Railroad Business Is Still Pending in Chicago—New York Trade Figuring on Export and Domestic Lists

The general trend of the market, as evidenced by conditions existing in several of the cities where machine tools and machinery are principal products, is toward less activity on the part of buyers, but there nevertheless is a steady current of small purchases.

Comparatively nearby deliveries of high-grade standard machine tools are easier to obtain, and as deliveries improve purchasers become more discriminating and sales are not so quickly made. The circumstance indicates the change which has come over buying. The pressure of demand is no longer such that tools of unestablished reputation are eagerly taken, as was the case when the war contractors dominated the market.

Most of the railroad inquiries before the Chicago trade are still outstanding, the purchasing agents evidently pausing to digest the prices and deliveries which have been quoted. Meanwhile business of a miscellaneous character continues in good volume.

The Rich Twist Drill Company, Chicago, contemplates the purchase of new machinery to the amount of $50,000. An interesting incident in Chicago was the recent delivery of a vertical turret lathe which had been ordered in June, 1915, by an Indiana manufacturer.

The plant of the Kankakee Universal Welding Company, St. Anne, Ill., was recently destroyed by fire with a loss of $100,000, largely on equipment, all of which will be replaced. The plant manufactured wire wheels for automobiles.

In New York the Belgian Purchasing Commission is inquiring for 50 screw machines, and Hamilton & Hansell, engineers, are inquiring for a large list for export to Sweden. Another large list before the New York trade is that required by the Midvale Steel Company, Philadelphia.

The Pierce-Arrow Motor Car Company, Buffalo, has plans for another four-story addition to its plant, to cost $100,000.

Cleveland finds the market quieter, with the demand largely confined to single tools. In northern Ohio, further labor trouble has developed in various foundries and metal-working plants.

The Saxon Motor Company, Detroit, Mich., has acquired a large tract of land on which it proposes to erect a new plant. The Packard Motor Car Company, Detroit, has acquired the factory of the Krit Motor Company, which adjoins its plant.

The Michigan Stamping Company, Detroit, is preparing to erect a large plant consisting of several buildings, all to be equipped with traveling cranes and new machinery.

In Cincinnati Russian business continues to constitute the bulk of export buying. The miscellaneous domestic trade continues to grow. The Carlton Machine Company, Cincinnati, has been incorporated, and has purchased the plant of the William E. Gang Company, maker of radial drilling machines, and will operate it under the new name.

The Simplex Machine Tool Company, Hamilton, Ohio, is buying equipment in Cincinnati. It was recently organized to take over the plant of the McKern Machine Tool Company, Hamilton, and is closely affiliated with the Cleveland Machinery & Supply Company.

In Milwaukee the labor situation is quiet, and tool builders there continue to receive a large volume of single tool orders.

The Birmingham district is becoming busier in reflection of the great activity in the steel business.

On the Pacific Northwest the demand for miscellaneous equipment continues brisk, and buyers are showing less reluctance to pay the prices asked, particularly if early deliveries can be made.

New York

NEW YORK, May 16, 1916.

Deliveries on standard lines of machine tools are still hard to get. Although they have improved a bit, the demand steadily tends to become more discriminating. Business is good. A few large transactions are before the trade and a considerable number of small lots, but as compared with the strenuous business that has been the rule, it seems quieter than it really is.

The Belgian consulate, 25 Madison Avenue, New York, is seeking 50 screw machines for July delivery. The C. & C. Electric Mfg. Company, Garwood, N. J., is seeking equipment to turn out 50 fuse sockets an hour. Some small lots of lathes are being sought for foreign shipment.

The inquiry which Hamilton & Hansell, 17 Battery Place, New York, are handling embraces about 430 machines, including 26 lathes for turning locomotive and car wheels, 245 engine lathes, 100 turret lathes, 70 milling machines and 90 boring machines. All of the measurements are metric.

The Midvale Steel Company has not yet closed for the equipment it will install in its Nicetown, Philadelphia, shop.

The Sun Shipbuilding Company, Chester, Pa., which recently let the contract for structural material required for its shop buildings, is in the market for punches and shears and other equipment used in plate-working.

It is reported that plans are being drawn by Harris & Richard, Drexel Building, Philadelphia, for the construction of an addition to the plant of the Niles-Bement-Pond Company, Plainfield, N. J., one story, of brick, concrete and terra cotta, 72 x 215 ft., on which bids will be taken about May 23.

The Nathan Mfg. Company, 101 Park Avenue, New York, has awarded to Rheinstein & Haas, Inc., contracts for erecting its new reinforced-concrete factory buildings, administration building, warehouse, garage and docks at Flushing, L. I., to cost $500,000. According to the plans the factory will consist of a central craneway, 311 ft. long, with six two-story buildings at right angles to it, 60 x 150 ft. each. The administration building will be located at the head of the craneway, overlooking the entire plant. There will be railroad sidings and docks for handling large cargoes. Work will be started at once, and it is expected that the entire plant will be completed in six months.

The Vulcan Brake Shoe & Equipment Company has been incorporated in Delaware with an initial capital of $1,000,000. It has established offices in the Equitable Building, 120 Broadway, New York, and has taken over the plant formerly operated by the Baltimore Car Wheel Company at Baltimore, Md. W. H. McDonough, president, was formerly associated with the American Brake Shoe & Foundry Company; Edward Barrett Smith, vice-president, was with the Ramapo Foundry Company and the Ramapo Iron Works for 20 years. R. M. Brower, vice-president; F. W. Grant, secretary and treasurer; Robert M. Hill, engineer of tests, and H. Schoenheiter, foundry superintendent, were formerly connected with the American Brake Shoe & Foundry Company.

The Chandler & Farquhar Company, 32 Federal Street, Boston, Mass., has sold its patents, good will and business rights of the Colton combination lathe tool to the Keystone Equipment Company, 50 Church Street, New York, and Philadelphia. This line includes special fixture tools for turning, boring, threading, cutting-off and splining.

The Simplex Seamless Tube Corporation, Buffalo, has been incorporated with a capitalization of $50,000 to manufacture seamless tubes, etc., and will equip a plant on Niagara Street for manufacturing and redrawing tubes. A. W. Sawyer, J. Leroy Kenefick and C. A. Hamlin, 816 Fidelity Building, are the incorporators.

The Star Plating Works, Buffalo, will erect a two-story factory at 102 Broadway. M. J. Nowak, 98 Broadway, is manager.

The C. M. Bott Furniture Company, 170 Leslie Street, Buffalo, will build an addition to its factory at Leslie Street and the Erie Railroad.

The Delaware, Lackawanna & Western Railroad is building a one-story boiler house at its new passenger terminal at Main and Ohio streets and the Buffalo River, Buffalo.

The Pierce-Arrow Motor Car Company, Buffalo, has completed plans for another four-story addition to its plant at Elmwood and Great Arrow avenues and the New York Central Railroad, to cost $100,000, besides the four-story addition now under construction, which will also cost $100,000.

The Brown-Lipe Gear Company, Syracuse, N. Y., has commenced construction of a five-story and basement addition to its plant at South Geddes and West Fayette streets, 35 x 50 ft.

The Syracuse Malleable Iron Works, Syracuse, N. Y., has let contract for a two-story core building, 92 x 110 ft.

The Cutler Desk Company, Buffalo, has taken out building permit for an addition to be made to its factory at Churchill Street and the New York Central Railroad.

The C. Foote Mfg. Company, Nunda, N. Y., has filed incorporation papers to manufacture concrete mixers, contractors' supplies, etc. The capital stock is $100,000 and the incorporators are C. F. and C. E. Foote and E. L. Dake.

Articles of incorporation have been filed by the Roberts Iron & Metal Works, Buffalo, with a capitalization of $50,000 to manufacture stamped metal specialties. Richard H. Templeton, Morgan Building, Buffalo, is attorney and director.

Mowbray & Uffinger, architects, 56 Liberty Street, New York, are preparing plans for a powerhouse to be built and equipped by St. Bonaventure's College, Allegany, N. Y.

The Union Automatic Air Brake Company, Niagara Falls, N. Y., has filed incorporation papers showing capitalization of $200,000 to manufacture air brakes, railway safety devices, etc. F. A. Jones and H. C. Stines, Niagara Falls, and R. C. Palmer, Ellicott Square Building, Buffalo, are the incorporators.

John G. Elendt, engineer, Cutler Building, Rochester, N. Y., has completed plans for a chemical cold-storage building, 60 x 100 ft., two stories, of brick and concrete, to be erected at Ransomville, N. Y., by G. E. Hubble, at an estimated cost of $75,000.

Philadelphia

PHILADELPHIA, PA., May 15, 1916.

Contracts were awarded May 15 by the Midvale Steel & Ordnance Company for new buildings to cost $620,000. Barkley, White & Co., 1530 Chestnut Street, Philadelphia, received contract to build machine shop No. 7 in the Nicetown works at a cost of about $320,000. This building will be 217 x 542 ft., and it is reported will be used particularly in connection with the howitzer contract recently obtained by the company. The contracting firm is now engaged on the construction of a 1000-ft. machine shop at the Nicetown works. A second contract was awarded to Irwin & Leighton, 126 North Twelfth Street, Philadelphia, for a machine shop, blacksmith shop and yard runway at its Worth Brothers Company plant in Coatesville, 133 x 326 ft., 77 x 134 ft., and 75 x 280 ft., respectively, estimated to cost about $300,000.

Harrison Bros. & Co., Thirty-fifth Street and Gray's Ferry Road, Philadelphia, received bids May 12 for a one-story boiler house, 43 x 93 ft. M. P. Osborne & Co., 34 South Seventeenth Street, are the engineers.

The Summerdale Dyeing Works, Inc., Holmesburg, Pa., has had bids taken by W. E. S. Dyer, Land Title Building, Philadelphia, for the construction of a one-story steel frame powerhouse, 46 x 72 ft.

The Westmoreland Dye Works, Jasper and Westmoreland streets, Philadelphia, has awarded contract to A. J. Stewart, Jr., 2526 Orkney Street, for the erection of a boiler house, 39 x 51 ft., at Cornwall and Jasper streets, at a cost of $5,100.

The Hamilton Corporation has been formed by interests connected with the Hamilton Watch Company, Lancaster, Pa., to manufacture speedometers. It will be in the market from time to time for machinery. Special equipment for the work will be manufactured in the Hamilton Watch Company's plant, of which Charles F. Miller is president.

The United Cash Register Company, Philadelphia, has been incorporated with a capital stock of $5,000 by Marcus Schiff, Continental Hotel; Harry J. Pressman, 5143 Knox Street, and Myer Pressman, 4283 Viola Street, to manufacture cash registers and other store equipment.

N. W. Gingerich & Son, contractors, Manheim, Pa., are erecting a machine shop for the Hershey Machine & Foundry Company, near its present plant. It will be 52 x 144 ft., with office annex, 24 x 33 ft. The present machine shop will be used as a storage warehouse. The new building will enable the company to materially increase its output.

The Hubley Mfg. Company, Lancaster, Pa., has given its iron molders an increase of 5 per cent in their wages. This was the second voluntary raise within the last few months. The New Process Steel Company of Lancaster has also advanced wages.

The Cahall Motor Supply Company, 830 North Broad Street, Philadelphia, has been incorporated with a capital stock of $30,000 by Charles L. Cahall, 833 North Broad Street; Ralph J. Cahall, 5315 Angora Terrace, and Bruce L. Flemming, 1421 Arch Street, to manufacture automobiles and accessories.

Plans have been completed for a garage and repair shop, 51 x 123 ft., one story, for Elam Zimmerman, Manheim, Pa.

Day & Zimmerman, 611 Chestnut Street, Philadelphia, are drawing plans for alterations to the factory of the Charles Warner Company, and will be ready for bids in about a week. Factory equipment, including machinery, transmission, shafting, etc., is needed.

The Davis & Thomas Company, Catasauqua, Pa., is reported to have awarded contract for an addition to its pattern shop, 30 x 60 ft., three stories.

The Pennsylvania Shipbuilding Company, which recently purchased a tract at Gloucester, N. J., on which the company has established a ship plant, also has purchased, through William C. Benkert, from George W. Jessup & Sons, agents for David Baird, another tract adjoining. The company's holdings now amount to 22 acres. It has orders which will keep its plant busy for two years.

The International Steel Plate & Shipbuilding Company, Quantico, Va., will be incorporated with a capital stock of $1,000,000, and will take over the International Steel Plate Company of Quantico, Va., and Wilmington, Del. Headquarters have been established in the Munsey Trust Building, Washington, D. C., Hugh McIsaac, secretary, in charge. Plans have been made for entering the shipbuilding business. The first unit of the plant will be about 80 x 200 ft., of concrete and steel, estimated to require $30,000 worth of equipment. Thomas J. Shea, Portland, Ore., is president. The company is said to be bidding on the manufacture of tank vessels.

Baltimore

BALTIMORE, MD., May 15, 1916.

The Myerberg Lighting Company, 210 North Calvert Street, Baltimore, has purchased the property 418 North Calvert Street, and is considering the establishment of a plant to manufacture lighting fixtures.

The Multiple Offset Machine Company, Baltimore, has been incorporated with $100,000 capital stock by Ashley G. Ogden, 109 South Charles Street; Harry S. Warfield and William Caldwell.

The Pyrites Company, Ltd., Wilmington, Del., has been granted a permit to erect a five story steel and concrete building, 69 x 76 ft., to cost about $29,000, on property recently acquired.

The Coastwise Shipbuilding Company, Baltimore, has been incorporated with $100,000 capital stock by Thomas Whedbee, Frank A. Brandy and R. Williams, with offices at 1411 Fidelity Building. Ways which are being constructed at the foot of Andre Street by the McLean Contracting Company will probably be leased. It is stated that the company will specialize on schooners with auxiliary oil-burning engines.

Charles L. Reeder, Park Avenue and Saratoga Street, Baltimore, is preparing plans and specifications for an electric light and power plant for the municipality of Frederick, Md.

J. C. Holcombe, Danville, Va., will erect a brick garage and machine shop.

The Vacuum Pulp Products Company, Richmond, Va., has been incorporated with $100,000 capital stock. J. H. Bocock is secretary.

New England

BOSTON, MASS., May 15, 1916.

The New London Ship & Engine Company, Bristol, Conn., has had plans completed for an extension, 58 x 68 ft., to its power plant.

The Bantam Anti-Friction Company, Bantam, Conn., has awarded a contract for a factory and office building, 30 x 30 ft., two stories.

The Larson Spring Company, Boston, Mass., has been incorporated with a capital stock of $25,000 to manufacture vehicle springs. The directors are Joseph H. Caldwell, president; Benjamin O. Larson, treasurer, and J. E. Boyd.

The Meekers Union Foundry, Norwalk, Conn., has secured a permit for a one-story addition, 35 x 100 ft.

The Simonds File Company, Fitchburg, Mass., is building an addition, 93 x 100 ft., connecting two of the present buildings. This is the second addition within two years and will mean a considerable increase in the working force.

The Winter Bros. Company, manufacturer of taps and dies, Wrentham, Mass., is building a one-story brick addition to its plant, 40 x 125 ft.

Indianapolis

INDIANAPOLIS, IND., May 15, 1916.

The Merchants Heat & Light Company, Indianapolis, has asked permission to issue bonds and stock amounting to $425,000 for improvements, to include boiler plant equipment, meters, steam power plant equipment, etc.

The Wilberg Mfg. Company, Indianapolis, has been incorporated with $50,000 capital stock to manufacture vehicles. The directors are C. A. and V. B. Wilberg and C. H. Leaf.

The Standard Protective Association, Indianapolis, has been incorporated with $25,000 capital stock to manufacture monograms, letters and numbers. The directors are A. D. Koch, A. M. Feemster and A. R. Feemster.

The Savidge Steering Device Company, Indianapolis, has changed its name to the Savidge Company.

The W. R. Wheeler Company, Indianapolis, has been incorporated with $25,000 capital stock to manufacture automobile accessories. The directors are W. R. and G. R. Wheeler and R. C. Shaneberger.

The Tractor Mfg. Company, Angola, Ind., has been incorporated with $200,000 capital stock to manufacture tractors, trucks and automobiles. The directors are James F. Fulton, George W. Davis and Charles I. Kemery.

The Jenney Shock Absorber Company, Indianapolis, has changed its name to the Jenney Mfg. Company.

The George W. Davis Motor Car Company, Richmond, Ind., has increased its capital from $60,000 to $160,000.

The Superior Machine Tool Company, Kokomo, Ind., formerly the Kokomo Nail & Brad Company, has increased its capital $7,000.

The Wainwright Engineering Corporation, Fort Wayne, Ind., has been organized with $200,000 capital stock to manufacture engines. The directors are W. W., H. A. and B. F. Wainwright.

The Superb Mfg. Company, Remington, Ind., has been incorporated with $10,000 capital stock to manufacture automobile accessories. The directors are Louis B. and O. B. Elmore and Stoker Burns.

The North-Frazier Lumber & Spoke Company, Portland, Ind., has been incorporated with $10,000 capital stock as lumber manufacturer. The directors are Will L. North, Lute Frazier and Edwin B. Hopkins.

The Pet-Son Pump Company, Ferdinand, Ind., has been incorporated with $10,000 capital stock to manufacture pumps. The directors are Theodore Peters, Albert F. and Joseph A. Sondermann.

The Peerless Brass Foundry & Machinery Company, South Bend, Ind., has been incorporated to manufacture brass, aluminum and steel. The directors are Jay H. Woodward, Anthony M. Fortenbacher and Robert F. Miller.

The Removable Catch Basin Company, Lafayette, Ind., has been incorporated with $25,000 capital stock to manufacture catch basins. The directors are W. J. Fox, G. C. Fidler and Henry Kerkhoff.

The Ideal Auto Mfg. & Sales Company, Fort Wayne, Ind., has been incorporated with $25,000 capital stock to manufacture and repair motor vehicles. The directors are Charles J. Scheimann, B. Paul Mossman and George B. Hall.

The Central Foundry, Vincennes, Ind., which has been closed down since 1914, is to resume operations in the early summer.

The National Car Coupler Company, Attica, Ind., is building an addition to its plant to cost $100,000.

C. A. Boyer has purchased the equipment and business of the Brazil Welding Company, Brazil, Ind., and will operate the plant.

Chicago

CHICAGO, ILL., May 15, 1916.

The inquiries for machine tools which have recently come from the railroads and are for the most part still outstanding constitute the most important business upon which the trade is now figuring. Additional lists are also expected. It would seem that the railroads are attempting to interpret the quotations they have received with respect to prices and deliveries, and it is likely that the amount of buying to be done at this time will be determined by their expectancy of the future course of prices as much as by the urgency of their needs. Business of a miscellaneous character is in good volume in the aggregate, but includes no individual lots of great prominence. For its new plant which it expects will be ready by Sept. 1, the Rich Twist Drill Company contemplates the purchase of new machinery to the amount of $50,000, if satisfactory deliveries can be had. An interesting instance of the delay in deliveries in the last year comes to hand in the case of an Indiana manufacturer, who ordered a vertical turret lathe and a large grinding machine in June, 1915, and received them this month, eleven months following.

The plant of the Kankakee Universal Welding Company, St. Anne, Ill., has been burned, with a loss of $100,000, largely on equipment. It will be replaced. The plant manufactured wire wheels for automobiles.

The Chicago Tire Pump Company, Chicago, has been organized with a capital of $7,200 by George Mahler, 130 North LaSalle Street, Arthur E. Stenzel and Anna Mahler.

The Master Tool Company, Chicago, has been incorporated with a capital stock of $5,000 by Albion W. Hobson, 180 North Dearborn Street, O. F. Barnes and Ray R. Barnes.

The Ahlberg Bearing Company, Chicago, has been incorporated by Charles J. Bender, 6016 St. Lawrence Avenue, Karl E. Ahlberg and Marcus A. Hurschl.

The Commonwealth Edison Company, Chicago, will build a large lighting and power plant in the southwest section of the city to cost several hundred thousand dollars.

The J. I. Case Threshing Machine Company, Peoria, Ill., will build an addition to its plant.

The Aurora Metal Cabinet Works, Aurora, Ill., has plans for the erection of a factory.

The American Wire Fence Company is remodeling a two-building factory at Libertyville, Ill., and equipping it with new machinery for the manufacture of steel gates and other products.

The Illinois Wire & Cable Company, Sycamore, Ill., has been incorporated with a capital of $125,000 by Louis Koth, M. E. Meuller and H. W. F. Pfingsten.

The Fountain Faucet Company, St. Paul, Minn., has been incorporated with a capital of $100,000 by A. W. Melander, O. S. Deringer, L. Bridges, Asa G. Briggs and John Everall. A plant will be erected as soon as a suitable site can be procured.

The Dickerson Automatic Governor Company, Duluth, Minn., has plans for the erection of a factory building in that city to cost $50,000.

Detroit

DETROIT, MICH., May 15, 1916.

The Saxon Motor Company, Detroit, automobile manufacturer, has acquired a large tract of land in the western part of the city, on which it is proposed to erect a new plant. The business of the company is rapidly increasing and it has recently become necessary to lease additional buildings to provide for immediate requirements. Harry W. Ford, president of the company, states that plans for the new plant have not been perfected.

The Michigan Steel Boat Company, Detroit, which recently disposed of its present plant to the Morgan & Wright Tire Company, is erecting a new four-story factory on a site of eight acres, recently acquired.

The Trippensee Mfg. Company, Detroit, manufacturer of automobile bodies, has increased its capital stock from $100,000 to $125,000 to provide for the enlargement of its plant.

The Packard Motor Car Company, Detroit, has acquired the factory of the Krit Motor Company, adjoining its plant. No announcement has been made as to what use the additional buildings will be put.

The Michigan Stamping Company, Detroit, is preparing to erect a new plant on a site of fifteen acres recently acquired.

The plans call for two manufacturing buildings, 60 x 580 ft. and 176 x 540 ft., respectively; a press shop, 80 x 540 ft., and a stock building, 60 x 290 ft. The stock building and press shop will be served by traveling cranes, and all the buildings will be equipped with machinery of the latest design.

A. Wegener & Sons, Detroit, bottlers, have awarded the contract for erecting a three-story brick addition to their plant.

The Detroit Steel Products Company, Detroit, will erect a one-story brick and steel addition to its plant.

The L. Bregand Mfg. Company, Detroit, has been incorporated with $8,000 capital stock to manufacture automobile accessories. The incorporators are R. L. J. Duquet, George C. Bonthinon and Sid A. Erwin.

The Detroit Gas Turbine Corporation, Detroit, has been incorporated with $25,000 capital stock to manufacture turbine engines. Gordon N. Pray, Rodgers Young and B. Colbert are the incorporators.

The plant of the Detroit Organic Chemical Company at Wyandotte, Mich., was destroyed by fire May 8, entailing a loss of $100,000. No information is available as to rebuilding. The company manufactures dyes and maintains offices in the Dime Bank Building Detroit.

The Reo Motor Car Company, Lansing, Mich., has begun the erection of a one-story addition to its heat treating department, 95 x 128 ft.

The Anti-Friction Lubricant Company, St. Joseph, Mich., has been organized with $20,000 capital stock to manufacture lubricating grease. It will erect a factory at once. The incorporators are J. J. Theisen, E. P. Clarke and Benjamin Reines.

The Jackson Welding Company, Jackson, Mich., has been incorporated with a capital of $10,000 and has plans under way for the erection of a factory. C. B. Hayes is president.

The L. O. Gorton Mfg. Company, Muskegon, Mich., will erect immediately at a cost of $10,000 a plant for the manufacture of automobile parts.

Cleveland

CLEVELAND, OHIO, May 15, 1916.

The local machine-tool market has quieted down considerably and little new demand is encountered except for single tools. The easing up has resulted in slightly better deliveries on milling machines and lathes. The call for steam hammers has improved, coming mostly from steel plants. Molding machines and other foundry equipment continue very active. Builders of power plant equipment report a good volume of business in small orders. Further labor troubles have developed in some northern Ohio foundries and other metal-working plants.

The National Artificial Silk Company, Cleveland, will erect near this city a four-story reinforced concrete building, 50 x 328 ft.; two one-story buildings, 164 x 371 ft. and 66 x 197 ft.; a boiler house, two tank houses and an office building. The Forest City Engineering Company, Cleveland, is preparing the plans.

The W. S. Bidle Company, Cleveland, will build an addition to its plant, 40 x 55 ft.

As soon as plans can be prepared the Timken Roller Bearing Company, Canton, Ohio, in addition to building an electric steel plant, will erect a continuous malleable iron foundry, with air furnace equipment and to have a daily capacity of about 40 tons. The product will be used in the company's other plants in the manufacture of automobile parts.

The Penfield Mfg. Company, Painesville, Ohio, maker of lathes, will occupy new quarters in the old Vulcan plant, having been forced to vacate the space it occupied in the plant of the Coe Mfg. Company. The latter company requires its entire plant because of the large volume of orders on hand.

The Louisville Foundry Company, Louisville, Ohio, recently organized, will establish a foundry in that city in the plant formerly occupied by the Bonnot Company of Canton. George Wendling of Canton and Edward Hagey of Louisville are stockholders.

The H. J. Harrold Tool Company, Columbiana, Ohio, has commenced the erection of an addition to include a main building, 40 x 126 ft., and adjoining buildings for office and power plant purposes.

It is reported that the American Steel Foundries plans an addition, 65 x 150 ft., to its plant at Alliance, Ohio.

The Humphrey Mfg. Company, Mansfield, Ohio, will make extensions to its plant to take care of its increased volume of business.

The Kressler Auto Company, Fostoria, Ohio, maker of automobile bodies, will enlarge its plant by the erection of a two-story addition, about 100 x 200 ft.

The Fostoria Stave & Barrel Company, Fostoria, Ohio, will build an addition to its plant and install wood-working machinery.

The Mansfield Electric Light & Power Company, Mansfield, Ohio, will shortly begin the erection of a new brick and concrete power plant, 150 x 150 ft.

The Miller Rubber Company, Akron, Ohio, in addition to two plant extensions now under way, will erect an eight-story factory building.

The Standard Die Tool & Machine Company, Toledo, Ohio, has been incorporated with a capital stock of $10,000 by G. D. Frank, M. B. McKinnon, J. H. Flaherty, H. E. Beicher and D. J. McKinnon.

Milwaukee

MILWAUKEE, WIS., May 15, 1916.

Machine-tool builders continue to receive a large volume of orders for single tools or small lots, local industries figuring prominently in these purchases. Conditions throughout the State appear to be similar to those in Milwaukee. The gas engine industry is passing through a period of unexampled activity, and farm implement and machinery makers are keeping busy through a season that is usually slack. Much complaint is heard from tool users over the lack of assurance from builders that equipment will be available as soon as new construction work is completed. At the present rate of bookings and production it will be well along in 1917 before tool makers can possibly guarantee deliveries as specified. The labor situation at this moment is quiet and production is going forward at the former unprecedented rate.

The Green Bay Drive Calk Company, Green, Bay, Wis., manufacturer of horseshoes and patent calks, has purchased the main building of the Hess Iron Works, and will move its shop. The force will be increased from 30 to 45 workmen.

Formal transfer of the Milwaukee assets of the International Steam Pump Company to the new Worthington Pump & Machinery Company has been effected. The Worthington Company has been granted a charter by the State of Wisconsin. The Wisconsin interest is given at $714,568.52 and consists of the Power & Mining Machinery, International Gas Engine and Fred M. Prescott Steam Pump companies, all located at Cudahy.

The Kimberly-Clark Company, Neenah, Wis., has awarded the general contract for the erection of a $15,000 addition to the powerhouse of the paper mills at Appleton, Wis.

The Gilson Mfg. Company, Port Washington, Wis., gray iron founder and gasoline engine builder, increased its capital stock from $60,000 to $90,000, and has purchased the chair-iron casting business of the Globe Foundry & Machine Company, Sheboygan, Wis.

The machine shop of John Landt, Hartford, Wis., has been leased by Harry Ewing, formerly traveling service man for the Kissel Motor Car Company, who will open a garage and repair shop.

The Federal Rubber Company of Massachusetts has been incorporated with $10,000,000 capital by the Fisk Rubber Company, Chicopee Falls, Mass., to take over the Federal Rubber Mfg. Company of Wisconsin, whose business and works at Cudahy, Wis., it recently acquired. Contracts for improvements costing more than $500,000 have been awarded and are now under way.

The Combined Locks Paper Company, Appleton, Wis., has been reorganized with a capital stock of $1,100,000, with Lewis Alsted, Milwaukee, president and A. J. McKay general manager. It is making preliminary plans for enlarging its plant.

The Northern Structural Iron & Boiler Works, Appleton, Wis., which intends to erect a new plant during the summer, is negotiating with the Business Men's Association of Menasha, Wis., for a change of location.

The Davidson Mfg. Company, Madison, Wis., incorporated with a capital stock of $30,000, will engage at once in the manufacture of automatic devices and attachments for typewriters. A plant is being equipped at 613 Williamson Street, and Chicago offices have been established at 107 North Market Street. The officers are: President, William Ward Davidson; secretary, W. L. McKay; treasurer, F. G. Rice.

The Goethal Blow Piping & Ventilating Company, Milwaukee, has changed its corporate style to Goethel-Smith Blow Pipe & Ventilating Company. Peter J. Smith is secretary.

John G. Barnsdale, 618 Tower Avenue, Superior, Wis., who has been manufacturing motor trucks on a small scale, is preparing to spend $50,000 for the erection and equipment of a plant. Preliminary plans have been prepared.

The Niagara Garage & Transfer Company, Niagara, Wis., has been incorporated with a capital stock of $20,000 by C. C. Stevens, Chester Brisbin and H. A. Stevens.

The Sun-Ray Mfg. Company, Oshkosh, Wis., has been incorporated with a capital stock of $20,000 to manufacture automobile lighting devices and other electrical goods. The promoters are A. W., J. W., and A. F. Dunham.

The Perfex Radiator Company, Racine, Wis., manufacturer of radiators for automobile, truck and tractor engines, will erect a new plant. Plans are being prepared by Chandler & Park, architects, 400 Main Street, Racine, for a main building, 65 x 250 ft., a warehouse, and a powerhouse.

The Appleton Wire Works, Appleton, Wis., specalizing in wire cloth for paper and pulp mills, is erecting a new annealing room and storage house, 35 x 104 ft., of fireproof construction. Several new looms will be installed, making a total of 50. A. B. Weisenborn is president and general manager.

The Warning Sheet Metal Company, Ceape and State streets, Oshkosh, Wis., has awarded contracts for a two-story brick and concrete addition, 40 ft. square.

The John Hoberg Paper Company, Green Bay, Wis., will build an addition, 75 x 175 ft., to cost approximately $70,000. New machinery will be installed.

Cincinnati

CINCINNATI, OHIO, May 15, 1916.

The foreign demand for machine tools continue to decline. Some Russian business is still coming in, but no large orders have lately been received from this source. It is also known that manufacturers of war munitions in this country are now curtailing their purchases. The miscellaneous domestic business is improving, with the automobile and auto-truck manufacturers placing a good part of the business.

The Carlton Machine Tool Company, Cincinnati, has been incorporated with $50,000 capital stock by Jack C. Carlton, E. P. Lamping, James B. O'Donnell, R. C. Cronin and A. Wood. It has purchased the plant of the William E. Gang Company, maker of radial drilling machines, and will operate it under the new name. It is not yet known as to whether other machine tools will be manufactured. Jack C. Carlton will be president of the company.

The pattern shop and part of the foundry of the Spicer Mfg. Company, New Philadelphia, Ohio, were destroyed by fire May 9, the estimated loss being $25,000. Rebuilding operations will begin at an early date.

The Indiana Public Service Commission, Aurora, Ind., will soon advertise for bids on an engine for the municipal water and lighting plant.

The Rustler Mfg. Company, Dakota Avenue and the Big Four Railroad, Piqua, Ohio, has been incorporated with a capital stock of $100,000 and has established a plant at Piqua of 15,000 sq. ft. of floor space for the manufacture of a machine to top sugar beets. Walter B. Smith is president.

The Corcoran Mfg. Company, Cincinnati, has been incorporated with $10,000 capital stock by Frank E. Wood and others to manufacture automobile specialties. Nothing is yet known as to manufacturing plans.

Plans are being prepared for the city of Cincinnati for a new high-pressure pumping station to be located at Eighth Street and Eggleston Avenue.

H. L. Beeler, general superintendent, Cleveland Machinery & Supply Company, Cleveland, is in Cincinnati buying equipment for the Simplex Machine Tool Company, Hamilton, Ohio. The Simplex Company was recently organized to take over the plant of the Kern Machine Tool Company at Hamilton, and is closely affiliated with the Cleveland Company. Its officers are as follows: President, Stanley Sparks; general manager, Charles D. Gibson; treasurer, John O'Brien, and secretary, W. B. McNaughton.

It is rumored that the Harrison Balancing Machine Company, Hamilton, Ohio, recently incorporated, is contemplating establishing a factory for the manufacture of an office specialty. J. P. Harrison is president.

The Fyr Fyter Company, Patterson Building, Dayton, Ohio, whose incorporation was recently noted, will soon have plans prepared for a factory for the manufacture of portable fire extinguishers.

The Moore-Eastwood Mfg. Company, Dayton, Ohio, E. F. Moore, president, advises that it is fitting up a plant for the manufacture of gages, dies, tools, fixtures, etc., and for the perfection of inventions. H. W. Moore an expert tool designer, is general superintendent and A. C. Eastwood is secretary.

The Sheffield Steel & Machine Company, Dayton, Ohio, has been incorporated by Charles Watterson, Percy Biggs and others. Manufacturing plans have not yet been given out.

The Buckeye Incubator Company, Springfield, Ohio, has acquired the manufacturing rights for a coal-burning brooder, and will make an addition to its plant at an early date, for which special equipment will be required.

The Crown Pipe & Foundry Company, Jackson, Ohio, is building an addition to its foundry, 90 x 150 ft., and one to its machine shop, 20 x 40 ft., both one story, of brick construction.

The Hobart Mfg. Company, Troy, Ohio, is making an addition to its plant, 50 x 115 ft., three stories, of brick construction. Light wood-working equipment will be required.

St. Louis

ST. LOUIS, MO., May 15, 1916.

Machine-tool business is reported to be maintaining its volume of inquiry. Deliveries show some degree of improvement. Second-hand machinery has practically disappeared from the market. Financial conditions are very comfortable, both as to commercial loans and investment capital. Collections continue very good.

The Mechanical Development Company, St. Louis, Mo., has been incorporated with a capital stock of $12,000 by L. A. Mapel, E. C. Wheeler, and others, to manufacture mechanical devices.

The Metal Hosiery Form Company, St. Louis, Mo., has been incorporated with a capital stock of $12,000 by William Baer, Frank Teichgraber, and others, to manufacture laundry and knitting mill equipment.

The American Liquid Heat Company, St. Louis, Mo., has been incorporated with a capital stock of $150,000 by Seymour and Edwin Schiele, Louis Mayer and Jesse G. Kramer to manufacture heat-producing compounds.

The New Hampton Implement & Hardware Company, New Hampton, Mo., has been incorporated with a capital stock of $10,000 by S. L. Crane, F. J. Hesseltine and S. L. Johnson to manufacture implements, tools and machinery.

The Redell Motor Car Company, Joplin, Mo., has been incorporated with a capital stock of $12,000 by A. T. Blackwell, E. Barrett and J. T. Hughes and will equip a machine and repair shop in connection with a garage.

The Ripley Mfg. & Machinery Company, Joplin, Mo., has been incorporated with a capital stock of $13,000 by J. F., E. C. and C. B. Ripley to build mining machinery.

The Erickson-Hentzen Casket Company, Kansas City, Mo., has been incorporated with a capital stock of $14,000 by C. E. and A. B. Erickson and C. J. Hentzen to manufacture burial cases, etc.

Slater, Mo., has voted to expend $35,000 for additional electric light and waterworks equipment. L. E. Shepherd is superintendent.

The Marionville Ice & Cold Storage Company, Marionville, Mo., will equip a cold storage plant and will install three 15-ton refrigerating machines.

The Molarkas Mining Company, Pierce City, Mo., E. P. McReynolds, president, is in the market for one 250-hp. Corliss engine, two 250-hp. boilers, compressors, etc.

The commissioners of the waterworks improvement district at Rector, Ark., J. C. Rogers, chairman, will equip a waterworks plant to cost $50,000, electric or oil power, operated by triplex or centrifugal pumps. Frank L. Wilcox, St. Louis, Mo., is the engineer in charge.

The Arkansas Light & Power Company, Arkadelphia, Ark., will rebuild the waterworks pumping plant and install new pumps at Morrilton, Ark.

H. A. Bones, Ada, Okla., and W. G. Skelly, Tulsa, Okla., will equip a brick-making plant at Ada, installing a dry press machine and other equipment to cost about $3,000.

The Chandler Electric Company, Chandler, Okla., has been granted a new 20-year franchise and will install new equipment in its plant.

The Kusa Ice, Light & Power Company, Kusa, Okla., John G. Goshorn, Henryetta, Okla., in charge, will equip electric light and ice plants and is in the market for 100-kw. oil or steam-driven generator and an ice plant of 30 tons daily capacity.

The Leidecker Lawn Mower Company, Muskogee, Okla., will equip a plant for the manufacture of lawn mowers, requiring about $14,000 or machinery. F. W. Leidecker and others are stockholders.

Louis Bendt, M. E., Kansas City, Mo., and Samuel Travis, Tulsa, Okla., will equip a gasoline plant with a daily capacity of 10,000 bbl.

The Mid-Co Gasoline Company, West Tulsa, Okla., a subsidiary of the Mid-Co Petroleum Company, will equip an oil refinery of 3000 bbl. daily capacity.

The Miami Co-operative Ice Company, Miami, Okla., has been incorporated with a capital stock of $60,000 by G. Hall White and others and will equip an ice-making plant, cold storage warehouse, ice-cream factory, etc.

The Tulsa Ice & Cold Storage Company, Tulsa, Okla., will equip a plant with ice-making capacity of 150 tons daily as well as cold storage for 100,000 bbl. or equivalent. H. P. Anderson is manager.

Idabel, Okla., will expend about $7,000 on its waterworks, the new equipment including a motor-driven pump. A. R. Mitchell is mayor.

Commerce, Okla., is in the market for waterworks equipment, including air lift machinery complete with compressor, two 250-gal. per minute duplex power pumps with motors, and other machinery.

W. A. and Charles Birch and D. L. Bryant will equip a sawmill at Kittrell, Miss., with a daily capacity of 20,000 ft.

W. P. Winckler, Franklinton, La., is in the market for excelsior cutting equipment for a new plant.

The Sabine River Lumber & Logging Company, Oakdale, La., will equip a mill of 100,000 ft. of hardwood lumber daily capacity. A. P. Taylor is general manager. Albert Deutsch, San Antonio, Tex., is president.

The Illinois Central Railroad has plans for the equipment of a pre-cooling and car-icing station of considerable capacity at New Orleans. A. S. Baldwin, Chicago, Ill., is chief engineer.

The Carl Shipp Electric Light & Power Company, Winnsboro, La., will install one 50-hp. oil engine, one 35-kw. generator, one 25-hp. engine and one 15-kw. generator.

The Central South

LOUISVILLE, KY., May 15, 1916.

There appears to be more of a disposition to break orders up or there is a larger amount of smaller work coming out, and it is reported that parts and additions are more numerous. The volume of business being done, however, is holding up very well indeed. Capacity operations continue the general rule. In the ice machinery line orders for tanks and parts are plentiful, although the rush here is done for the season. Power equipment is still in wide demand and inquiries continue numerous. The machine-tool business holds strong. The electrical trade finds the demand for motor equipment increasing. Inquiries show that many manufacturers are contemplating changing over from steam to electric power.

The Nicholson Furnace Company, of Springfield, Ill., will move its principal plant to Louisville and has opened offices at 2938 Portland Avenue. It manufactures undergrate draft blowers, draft bars and a special regulator. Edward J. Hackett, Sr., is president and treasurer.

The construction of the grain elevator, South Brook Street, projected at an estimated cost of $100,000 sometime ago by W. A. Thomson & Co., will begin shortly.

The Puckett Creek Coal Company, Middlesboro, Ky., is to rebuild the electric power plant which was burned some time ago. It cost originally $10,000.

Two power houses are included in the plans of the Shelbyville & Frankfort Realty Company, which propose to build an electric railway. E. H. Taylor, Jr., Frankfort, is president.

Electric power will be purchased by the Bluegrass Lumber Company, Lexington, Ky., which will shortly begin to build a plant.

The Grunwald Woodworking Company, Louisville, has been incorporated with $5,000 capital to manufacture wooden specialties. The incorporators are Joseph A., Edward T. and Fred K. Grunwald.

The F. W. Brehman Machine Company, Newport, Ky., has been incorporated with $5,000 capital by F. W. Brehman, William F. Clark and Charles P. Simon.

The G. W. Simmons Company, 118 North Front Street, Memphis, Tenn., is in the market for a 7-ft. bandmill, filing room machinery, etc.

Prices on garage equipment, including air compressors, tanks, etc., are wanted by Robert Burrows, Jr., Johnson City, Tenn.

The Chattanooga Packet Company, which has been reorganized, C. H. Huston, president, contemplates using self-propelled barges for river traffic between Chattanooga and points on the Mississippi River.

The Lonsdale Brick & Pottery Company, organized to take over the Lonsdale Brick Company plant at Lonsdale, Tenn., has purchased machinery for manufacture of 50,000 brick daily. A. C. Morris is president and L. D. Morris, vice-president and manager.

General dyehouse equipment will be installed by the Ohio Falls Dye & Finishing Works, 719 East Madison Street, Louisville, in connection with an addition of 30,000 sq. ft. to the plant. J. J. Brown is in charge.

Articles of incorporation have been filed by the Greenwald Wood-Working Company, Louisville, with $5,000 capital by Joseph A., Edward T. and Frederick K. Greenwald to manufacture wooden articles.

Birmingham

BIRMINGHAM, ALA., May 15, 1916.

Structural activity in the Southern States has increased to a marked extent in volume and variety and calls for much machinery equipment of all sorts. Wholesale machinery dealers are satisfied with present conditions and the prospect of summer business and look forward to a very brisk autumn. The demand for electrical apparatus is hard to meet in time desired. It is even more acute with regard to machine tools. Brokers for big machinery report inability to secure delivery promises under 8 and 9 months and in one instance 14 months.

The Gulf Compress Company, New Decatur, Ala., will expend $150,000 to $200,000 rebuilding its plant, recently burned. C. C. Hanson is receiver.

The Alabama Machinery & Supply Company, Montgomery, Ala., has been incorporated with a capital stock of $25,000, and privilege to increase it to $100,000.

The Augusta Cement Products Company, Augusta, Ga., has been incorporated with a capital stock of $50,000 by S. C. Wilbur and others to manufacture cement products.

The Blackman Coupler Company, Graceville, Fla., has been incorporated with a capital stock of $1,000,000 to manufacture car couplers. Thomas G. Blackman, Jr., Michael O. King, and others, are stockholders.

The Tidewater Development Company, Jacksonville, Fla., capital stock $2,500,000, has been incorporated by Henry H. Buckman, George S. Pritchard, and others, to manufacture and deal in iron, steel, copper, lumber and other products.

Texas

AUSTIN, TEX., May 13, 1916.

An unusually large demand exists for machinery for public utility plants. Several large bond issues for improvements are pending, in addition to those recently issued. The acute situation on the Mexican border has only affected the machinery and tool trade in a small scope of territory.

The City Council, Christine, will install a waterworks pumping station.

The Jacksboro Mill & Elevator Company, Jacksboro, has purchased the local electric light and power plant from the Jacksboro Light Company and will install new machinery.

The City Council, Franklin, will soon begin the construction of a municipal electric light and waterworks plant.

The Watson-Christianson Lumber Company, Hemphill, will rebuild its lumber mill, which was recently destroyed by fire. It had a daily capacity of 50,000 ft. of lumber.

The Humble Power & Ice Company, Humble, will build a new electric power and ice factory at a cost of about $30,000. F. O. Peters is interested.

The Texas Southern Electric Company plans to install new equipment in its power station at Cuero at a cost of about $10,000.

The irrigation pumping plant of the Moor's Bluff Rice Company, Dayton, will be equipped with new machinery.

The Ohio & Texas sugar mill at Brownsville will be rebuilt. New machinery will be installed.

The Tynan Gin Company, Tynan, will build a new cotton gin at a cost of about $12,000.

Anderson, Clayton & Co., will build a cotton warehouse at Houston with a capacity of 50,000 bales of cotton. It will be equipped with a trolley system.

The Pacific Northwest

SEATTLE, WASH., May 8, 1916.

Machine-tool buying has undergone a slight lull, apparently due to nervousness over the foreign situation, though figuring on more or less definite inquiries is keeping the trade quite busy. Orders from the smaller shops are keeping up well, with less reluctance to pay prices asked if early delivery can be had. The demand for miscellaneous machinery and second-hand tools continues exceptionally brisk; road-making machinery is covered in the inquiries, and several important orders for crushers and rollers have been recently placed. The approach of the irrigation season has created an active demand for electric pumping plants.

Large orders for lumber have been filed with Oregon and Washington mills, including an inquiry placed with the St. Paul & Tacoma Lumber Company, Tacoma, for 1,250,000 ft. Expansion of lumber operations continues, but an exceptional shortage of labor is reported in logging camps. Manufacturers and merchants handling logging and wood-working machinery have difficulty keeping up with orders. The demand for mining and metal reduction equipment is still expanding.

Statistics show that the four transcontinental lines into Seattle hauled in and out 1,536,520 tons of freight for the six months ended April 1, an increase of almost 400,000 tons over the same period for the previous season.

The Pacific Western Chemical Company, San Francisco, Cal., plans the construction of a chemical plant in the vicinity of Medford, Ore.

M. Senders & Co. have leased a grain elevator at Albany, Ore., and will put in new grain handling machinery.

The Northwest Steel Company, Portland, Ore., has had plans prepared for a frame addition, 80 x 206 ft., to its plant, to cost about $7,500. New machinery will be installed.

The Panama Shingle Company has changed its name to the Panama Lumber & Shingle Company, and increased its capital stock to $50,000. Its principal place of business has been moved from Tacoma to Olympia.

The Huffschmidt & Dugan Iron Works, Bend, Ore., has placed its new foundry in operation and reports orders sufficient to last several months. R. E. Huffschmidt and C. J. Dugan are the owners.

The Motor Ship Construction Company, a California firm, contemplates the erection of a shipbuilding plant in Portland to construct wooden vessels, according to M. A. Reed, Portland, Ore., attorney for the company.

The Crown-Willamette Paper Company is preparing to build an addition to its plant at Oregon City, Ore. It has purchased the entire equipment and machinery of the Coos Bay Pulp & Paper Company, of Marshfield, Ore., and will move the machinery to Oregon City. The company plans to build an experimental plant in connection with its mill at Floriston, Cal., for the utilization of waste material, and contemplates enlarging an old paper mill at Ocean Falls, B. C.

F. C. Knapp, president of the Peninsula Lumber Company, Portland, Ore., is at the head of a group of capitalists who have incorporated the Peninsula Shipbuilding Company with a capital stock of $20,000 and plan the erection of a shipbuilding plant adjoining the Peninsula lumber mill. Construction has begun on a plant which will construct wooden vessels, with capacity of 1,000,000 to 2,000,000 ft. of lumber.

Leach Brothers, formerly of Tacoma, Wash., will construct a one-story foundry at 2926 First Avenue South, Seattle, to be equipped with new machinery and equipment.

O. Lyon, Buckley, Wash., and William Young, Tacoma, have formed the Pacific Ice Machine Company, Tacoma, and will construct a factory to manufacture refrigerating plants.

The car shops of the Chicago, Milwaukee & St. Paul Railroad, in Tacoma, Wash., will construct 75 logging cars for the Puget Sound & Willapa Harbor line.

Canada

TORONTO, May 15, 1916.

The Montreal Central Terminal Company will build a central terminal in Montreal, and has prepared plans for a tunnel under the St. Lawrence River, to connect the two shores. The scheme will cost between $30,000,000 and $40,000,000.

The planing mill, sawmill and engine room of the L. W. Fick & Son's plant at the corner of Colborne and Maple streets, Simcoe, Ont., was totally destroyed by fire, with a loss estimated at $50,000, including much of the machinery.

A. E. McDonald, South Brock Street, Sarnia, Ont., is in the market for a 50-hp. gas engine.

The Electrical Fittings & Foundry Company, Ltd., has secured the building formerly occupied by the Anchor Bedding Company at Preston, Ont., and will install equipment and commence manufacturing at an early date.

The Canadian Machinery Building at Preston has been taken over by the Metal Shingle & Siding Company, Preston, Ont., and will be equipped for the manufacture of a number of new lines.

M. Brennan & Sons, Hamilton, Ont., are in the market for a nailing machine.

The plant of the General Car & Machinery Company, Montmagny, Que., was damaged by fire to the extent of $300,000. Work will not be interrupted according to General Manager Charles A. Paquet. The latest buildings erected remain, and machinery will be installed in them as rapidly as possible.

The plant of the Lampman Pump Works, Peel Street, Simcoe, Ont., was totally destroyed by fire with a loss of about $25,000.

The Dominion Stove & Foundry Company, Penetanguishene, Ont., is making extensive additions to its plant and will install equipment for the manufacture of furnaces, etc.

H. Morgan & Co., 16 Beaver Hall Hill, Montreal, will build a brick and concrete garage to cost $10,000.

The Burrows Refining Company, 629 Wellington Street, Ottawa, Ont., will erect a nickel refinery to cost $6,000.

William Lockhart, Ruscomb, Ont., is considering the erection of a plant for the manufacture of brick, tile, etc., to cost $10,000.

Omer Bergeron, St. Clothilde, Que., will erect a sawmill to cost $7,000.

The Columbus Rubber Company, 146 Iberville Street, Maisonneuve, Que., will build a brick and concrete addition to its plant to cost $20,000.

The American Cyanamid Company, Niagara Falls, Ont., will have a plant erected at once to cost $20,000.

The Martin Pump & Machine Company, 43 Davies Avenue, Toronto, will erect a factory at Wilton and Broadview avenues, of brick, to cost $10,000.

Berlin, Ont., will install electric well pumps in connection with its water system. H. Johnston is engineer.

Hamilton, Ont., is in the market for a gasoline tank pump and oil cabinet, etc., for the city garage. S. H. Kent is city clerk.

Vancouver, B. C., will install a 4-in. motor-driven pump at the Parker Street Pumping Station to cost $1,200. F. L. Fellows is city engineer.

The American Radiator Company, Ltd., Brantford, Ont., has been granted a permit for the erection of an addition to its plant to cost $8,000.

The Lake of the Woods Milling Company, Medicine Hat, Alberta, will build a large steel and concrete mill to replace the one recently destroyed by fire with a loss of $200,000.

The Canadian Western Steel Company, Ltd., has purchased the plant of the Redcliffe Rolling Mills, Redcliffe, Alberta, and will build an addition to the plant to cost $15,000 and will install $60,000 worth of new machinery.

The Breen Motor Company will build a garage, 50 x 116 ft. on Broadway, Winnipeg, Man., to cost $15,000.

The St. Charles Chemical Company, Ltd., St. Charles Barromee, Que., has been incorporated with a capital stock of $100,000 by Joseph A. Guibault and Hector Trudeau, Joliette, Que.; Andre C. Attendu, St. Charles Barromee, and others, to manufacture machinery, tools, war munitions, etc.

The Quality Canners of Canada, Ltd., Windsor, Ont., has been incorporated with a capital stock of $250,000 by Earl C. Awrey, Leamington, Ont.; William H. Furlong, Windsor; William Wall, Merlin, Ont., and others, to build and operate canneries and to manufacture bottles, cans, and other containers.

The Mutual Chemical Company of Canada, Ltd., Sherbrooke, Que., has been incorporated with a capital stock of $49,000 by Charles W. Cate, John P. Wells, Charles D. White, and others.

The Millers Extracts, Ltd., Montreal, has been incorporated with a capital stock of $200,000 by George W. MacDougall, Lawrence Macfarlane, William B. Scott, and others, to manufacture dyes, extracts, etc.

The Globe Shock-Absorbing Tire Company of Canada, Ltd., St. Catharines, Ont., has been incorporated with a capital stock of $1,000,000 by Isaac Normandy, Howard J. Eccleston, Clarence L. Rolls, and others.

The Goderich Mfg. Company, Ltd., Goderich, Ont., has been incorporated with a capital stock of $100,000 by John E. Baechler, Jacob J. Baechler, and others, to manufacture furniture, woodenware, and articles of iron and steel.

The Chemical Products of Canada, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Terence E. O'Reilly, 1110 Temple Building; William S. Morlock, 107 Roxborough Street West; George G. Grover, 116 Indian Road, and others, to manufacture chemicals, dyes, war munitions, etc.

The Milton Pressed Brick Company, Ltd., Toronto, has been incorporated with a capital stock of $1,500,000 by Arthur W. Holmsted, room 43, 20 King Street East; Norman R. Kay, Lorne F. Lambier, and others.

The Dominion Tygard Engine Mfg. Company, Ltd., Toronto, has been incorporated with a capital stock of $100,000 by Adam McG. Cook, 67 Gloucester Street; Irene House, Irene O. Allen, and others, to manufacture steam, gas, or electric engines and accessories.

Government Purchases

WASHINGTON, D. C., May 15, 1916.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, schedule 9624, for one matching and planing machine and schedule 9625, for one bolt-threading machine and two precision lathes, all for Puget Sound; schedule 9626, for two cargo oil pumps for Mare Island; schedule 9633, for one chucking outfit and two drilling machines for Newport.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, May 9, for supplies for the navy yards, as follows:

Schedule 9461—Construction and Repair

Class 1, Brooklyn—One angle, channel and Z-bar beveling machine—No bids.

Schedule 9484—Ordnance

Class 11, Mare Island—One hydraulic banding press—Bid 76, $1,400; 104, $2,600; 125, $1,515; 152, $1,020; 159, $3,661 and $2,946; 160, $2,649 and $1,932; 168, $775 and $916; 229, $2,620; 241, $1,550; 262, $1,974; 263, $1,055, f.o.b.

Schedule 9485—Steam Engineering

Class 21, Mare Island—One motor-driven tool room lathe—Bid 104, $2,256.70; 125, $1,140; 180, $2,975; 242, $1,935.

Schedule 9514—Construction and Repair

Class 31, New York—One steam hammer—Bid 106, $5,730, f.o.b.; 152, $6,150, $6,600, $6,850, $7,100; $7,550, and $7,800; 167, $9,170 and $9,820; 202, $9,360; 222, $8,700.

Alternate—Same, f.o.b. San Francisco. Bid 167, $10,887 and $11,537; 202, $11,110; 222, $9,500.

Schedule 9520—Yards and Docks

Class 161, Norfolk—One railroad track scales—Bid 87, $3,356, part, $2,850, part, and $2,297, part; 210, B, $4,700, D, $3,770.

Schedule 9551—Steam Engineering

Class 201, Brooklyn—One precision bench lathe, with milling cutters—No bids.

Alternate—Same, without cutters—No bids.

Class 202, Brooklyn—One universal milling machine, with complete set of cutters—Bid 20, $2,070.51.

Alternate—Same, without cutters—Bid 20, $1,731.50.

The names of the bidders and the numbers under which they are designated in the above list, are as follows:

Bid 20, Brown & Sharpe Mfg. Company; 76, Richard Dudgeon; 87, Fairbanks Company; 104, Harron, Rickard & McCone; 106, Handlan-Buck Mfg. Company; 125, Kemp Machinery Company; 152, Manning, Maxwell & Moore, Inc.; 159, Metalwood Mfg. Company, Philadelphia; 160, Metalwood Mfg. Company, Detroit; 167, Niles-Bement-Pond Company; 168, D. Nast Machinery Company; 180, Pratt & Whitney Co.; 202, William Sellers & Co., Inc.; 210 Standard Scales & Supply Company; 222, United Engineering & Foundry Company; 229, R. D. Wood & Co.; 241, the Watson-Stillman Company; 242, Fred Ward & Son; 262, Universal Trading Company; 263, West Tire Setter Company.

NEW TRADE PUBLICATIONS

High-Pressure Pipe Covering.—Armstrong Cork & Insulation Company, Pittsburgh, Pa. Booklet. Treats of the subject of insulation for high-pressure and superheated steam lines in considerable detail. Attention is called to the comparative tests made at the company's plant which were mentioned in THE IRON AGE, May 4, 1916. As the result of these tests, the heat losses from various sizes of pipe, both covered and uncovered, were determined and tabulated. Information tables are given showing the most economical thicknesses of covering to use, and a complete set of specifications for the correct method of installing these various thicknesses of covering are included.

Industrial Buildings.—Westinghouse, Church, Kerr & Co., 37 Wall Street, New York City. Folder. Presents a brief description of the obstacles which had to be overcome in the building of the Canadian Pacific shops at Calgary, Alberta. In executing this contract 45 acres of prairie was transformed into railroad repair shops in less than a year. Mention is made of the advantages secured by having everything connected with the contract under one control, and a plan showing the arrangement of the shops and machinery is included.

Manganese Steel Chains.—Taylor-Wharton Iron & Steel Company, High Bridge, N. J. Bulletin No. 113-D. Covers a line of manganese steel conveyor and elevator chains, sprockets and parts. Views of the various chains are presented with brief descriptions of the service for which they are adapted. Among the work which the chains are designed to do are elevating and conveying gritty material, handling cement clinker, in coke machines and draw benches and for use in sand and gravel dredges. Mention is made of different types of buckets and sprockets that can be supplied, and tables of sizes are included for practically all the apparatus listed.

Pyrometers.—Leeds & Northrup Company, 4901 Stenton Avenue, Philadelphia, Pa. Bulletin No. 875. Describes the potentiometer pyrometer which is based upon the use of the thermocouple but differs from the ordinary pyrometer in that the electromotive force resulting from the temperature difference between the ends of the thermocouple is measured by a balancing method rather than by a deflecting galvanometer. Two general types of instruments are described, one having a hand-adjusted indicator and the other with an automatically adjusted recorder of either the single-point curve drawing type or the multiple-point printing class, the latter being capable of keeping records from sixteen different thermocouples if desired. Selector switches are provided to enable either indicators or recorders to be operated in connection with as many thermocouples as may be desired. Mention is also made of special apparatus for the location of the transformation point of steels.

Cut Nails.—La Belle Iron Works, Steubenville, Ohio. Booklet. Calls attention to a test that was made to determine the relative efficiency of cut and wire nails. Illustrations of the various nails that are regularly made are presented together with tables of the different sizes that can be supplied. Mention is made of the several special and galvanized nails that can also be furnished. Lists of extras of standard and special cut nails are included, together with a table giving the standard lengths of various sizes of nails.

Worm Gears.—Boston Gear Works, Norfolk Downs, Quincy, Mass. Pamphlet. Describes a line of worm, spiral and helical gears. Illustrations showing some of the forms that can be supplied are presented and the advantages of the various ones are briefly pointed out.

Springs and Screw Machine Products.—Wallace Barnes Company, Bristol, Conn. Booklet No. 7. Deals with various "Barnes-made" products, which include springs, screw machine products, cold-rolled steel and wire, washers, stampings, etc. After a concise description of the plant facilities which the company possesses, the different lines of products are described briefly with numerous illustrations of the various forms that have been made. A table for determining the capacity for round wire springs is given, and specifications and suggestions for ordering springs and screw machine products are included. Brief descriptions with illustrations are given of the various parts of the factory, and a list of the material carried in stock is presented. A number of tables of useful information are included.

Portable Tools.—Stow Mfg. Company, Binghamton, N. Y. Booklet. Relates to a line of portable tools either with or without flexible shafts that includes drilling, grinding and buffing machines. All of the several tools are illustrated and briefly described.

Steam Hammers.—Buffalo Foundry & Machine Company, Buffalo, N. Y. Catalog No. 1604. Treats of the Bell line of steam hammers which are built in a number of standard designs. A general description of the hammers is presented, followed by illustrations of the various types with brief descriptions of their special features and tables of specifications. The hammers shown include the single, double and open frame and combined types. Mention is also made of a line of motor-driven forging hammers and trimming presses. Drawings showing the foundations required for the standard hammers are presented and several special types, such as double frame tube, double open frame, axle forging and tire or band hammers, are shown.

Car Type Heat Treating Furnaces.—Metals Production Equipment Company, 105 West Fortieth Street, New York City. Bulletin No. 1, second addition. Illustrates an overfired type of furnace using either oil or gas fuel for heating and handling heavy material for annealing, hardening, tempering, carbonizing, etc. A brief description of the construction of the furnace is presented and the text is supplemented by a number of engravings of the furnace in actual use. Among the installations shown are single and double end furnaces for pack annealing steel shapes and heat treating steel forgings and locomotive rods. A sectional elevation diagram showing the interior construction of the furnace is presented, together with a table of the standard sizes that can be supplied.

Electric Grinding Machines.—Chicago Pneumatic Tool Company, 1010 Fisher Building, Chicago, Ill. Bulletin No. E-39, superseding E-36. Gives illustrations, brief descriptions and condensed specification tables for portable and stationary electric grinding machines which are designed for use on either direct or alternating current circuits. The machines shown include portable heavy duty ones for foundries, machine and structural shops, etc., a tool post machine and bench machines for external and internal grinding.

Judicial Decisions

ABSTRACTED BY A. L. H. STREET

VALIDITY OF FOREIGN CORPORATION'S CONTRACTS.—A law imposing conditions on the right of a non-resident corporation to do business in a State does not apply to a case where a machine was ordered through the agent of a foreign corporation, was built in the foreign State and then shipped into the particular State for delivery to the buyer, although the agent supervised the assembling of the machine and instructed the buyer concerning its operation. (Alabama Court of Appeals, Citizens' National Bank vs. Bucheit, 71 Southern Reporter, 82.)

WARRANTY OF MACHINERY BY SELLER.—It is only when machinery delivered to a buyer is worthless that he may recover the purchase price without returning or offering to return it to the seller. Damages recoverable by a buyer because of failure of machinery to possess the capacity it was represented by the seller to have is the excess of the value of the machinery as warranted above its actual value. (Kentucky Court of Appeals, Hauss vs. Surran, 182 Southwestern Reporter, 927.)

RIGHTS CONCERNING STREAMS.—A manufacturing company whose plant is situated on the bank of a river is entitled to make reasonable use of the waters of the stream as long as the rights of other owners of land along the stream are not injuriously affected, but such a company will be enjoined from encroaching upon the stream in such manner as to obstruct the operation of a dam by an upper owner, right to maintain the dam having been validly acquired. (Indiana Appellate Court, South Bend Mfg. Company vs. Bissell Chilled Plow Works, 111 Northeastern Reporter, 932.)

EMPLOYER'S LIABILITY FOR WORKMAN'S NEGLIGENCE.—In an action by an employee to recover for injuries sustained in the blacksmithing department of a manufacturing company, through negligence of a helper in setting a steam hammer in motion while plaintiff was placing a piece of metal to be forged, it is held that an employer is liable for injury resulting from negligence of a co-employee when it appears that the employer was previously chargeable with notice of such co-employee's habitual recklessness and was negligent in retaining him in the service, unless it appears that the danger was so great and so well known to the injured employee that he was guilty of contributory negligence in remaining at work under such danger. (Indiana Appellate Court, Hilborg vs. Nordyke & Marmon Company, 110 Northeastern Reporter, 684.)

MANUFACTURER'S LIABILITY TO ULTIMATE PURCHASER FOR DEFECTIVE CONSTRUCTION.—A manufacturer of a thing (in this case an automobile) is liable for injury to one who bought it from a third person, a dealer, who in turn bought from the manufacturer, for any defect negligently permitted to exist or remain at the time of the sale by the manufacturer, when the defect was such as naturally to imperil the ultimate user. In reaching this decision in the case of MacPherson vs. Buick Motor Company, 111 Northeastern Reporter, 1050, the New York Court of Appeals cites an early New York case where a manufacturer was held not liable for injury caused by a defect in a small balance wheel used on a circular saw. In that case, however, the manufacturer pointed out the defect to the buyer, who desired a cheap machine, and was ready to assume the risk. The machine was used for five years before the buyer's lessee was injured through the defect. Under these circumstances the court decided that the manufacturer was not responsible. In another case, it appears that the manufacturer of a boiler was exonerated from liability for explosion of a boiler, the buyer having relied on his own test and the manufacturer knowing that his test was not to be the final one. On the other hand, in the case of Statler vs. Ray Mfg. Company, 195 New York Reports, 478, the Court of Appeals held that defendant was liable to plaintiff for injuries sustained in the explosion of a coffee urn which had been installed in a restaurant, on the theory that such a device was dangerous if not properly constructed. The same rule of liability was applied by the Appellate Division of the New York Supreme Court in a case where plaintiff was injured through a defectively constructed elevator. The Court of Appeals approves the following statement of the law by an English judge: "Whenever one person supplies goods or machinery, or the like, for the purpose of their being used by another person under such circumstances that every one of ordinary sense would, if he thought, recognize at once that unless he used ordinary care and skill with regard to the condition of the thing supplied, or the mode of supplying it, there will be danger of injury to the person or property of him for whose use the thing is supplied, and who is to use it, a duty arises to use ordinary care and skill as to the condition or manner of supplying such thing."

EFFICIENCY OF MACHINE REPAIRS.—Even though an impeller sold to grading contractors for installation on a second-hand pump failed to come up to a warranty made by the seller that would not authorize the contractors to recover, as an element of damage, profits lost under a grading contract on which the pump was used. There was no implied warranty that the new impeller would make the old pump work satisfactorily. The impeller being sold with reference to a sample, there was no implied warranty other than that the one sold would come up to the standard of the sample. When a buyer of such repairs finds that they do not work satisfactorily the seller should be promptly notified and afforded opportunity to make the defects good. (Washington Supreme Court, Perine Machinery Company vs. Buck, 156 Pacific Reporter, 20.)

TRADEMARK RIGHTS.—A manufacturer of goods under a specific trademark or trade name who has confined his trade to a certain section of the country for many years, will not be entitled to enjoin another manufacturer from using the same mark or name in other territory invaded by the latter first, although the former may have originated the mark or name. Apart from technical trademark rights, a manufacturer is entitled to restrain a competitor from so dressing his goods as to tend to deceive the public into believing that in buying the latter's goods they are obtaining the former's. (United States Supreme Court, Hanover Star Milling Co. vs. D. D. Metcalf, 36 Supreme Court Reporter, 357.)

INTRASTATE FREIGHT RATE CONTRACT VALID.—A contract made by a railroad company with a Pennsylvania steel company to carry coal from mines in the same State to the steel company's plant at certain rates for 30 years was valid, although the railroad company's published tariff rates were afterward revised and raised. (Pennsylvania Supreme Court, Pittsburgh & Lake Erie Railroad Company vs. Colonial Steel Company, 96 Atlantic Reporter, 1037.)

BUYER'S RIGHTS ON BREACH OF WARRANTY.—When a contract for sale of machinery contains a clause to the effect that, if the machinery fails to conform to the seller's warranty, it shall be returned by the buyer, giving notice of dissatisfaction will not relieve the buyer from the conditions of the contract. And if the contract provide that the buyer's retention of the machine for a specified time shall be evidence of its conformity to the contract, such retention waives any claim by the buyer for damages on the ground of a breach of warranty. Generally the measure of damages for breach of warranty of a machine is the excess of the price of the machine above the value of the machine furnished. (Michigan Supreme Court, J. A. Fay & Egan Company vs. Cummer Mfg. Company, 157 Northwestern Reporter, 1.)

BUYER'S RIGHT TO DISCOUNT.—When a written order for goods, obtained by a traveling salesman and not procured by fraud, provides for a discount on payment on or before a specified date, the buyer is not entitled to rely upon a claimed verbal statement of the salesman that a discount would be allowed regardless of the time when the account should be paid. (Mississippi Supreme Court, Hickman Ebbert Company vs. Asa W. Allen Company, 71 Southern Reporter, 310.)